COTTAGE INDUSTRIES OF BENGAL

BY

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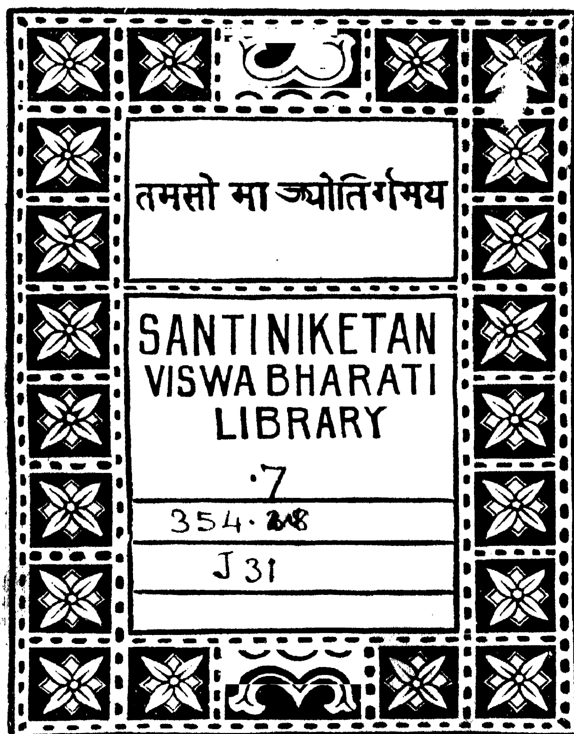
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PUBLISHED BY

CHUCKERVERTTY, CHATTERJEE & CO., LTD.
15, COLLEGE SQUARE, CALCUTTA,
1927.

Price Rupee one
Annas Eight only.

PUBLISHED BY—
ROMESH CHANDRA CHAKRAVARTI M. Sc.
15, COLLEGE SQUARE CALCUTTA.



KUNTALINE PRESS,
61, BOWBAZAR STREET, CALCUTTA.
PRINTED BY C. M. BISWAS.

PREFACE.

The available literature on our indigenous industries is undoubtedly scanty, though its usefulness in any scheme for their resuscitation and development can hardly be overestimated. The articles embodied in this small volume were contributed in a series to the Amrita Bazar Patrika. They purport to deal with the present condition of the existing cottage industries of Bengal, the methods of work in vogue and the difficulties under which our workers labour and also contain suggestions as to the steps that may be taken for the improvement of the various cottage industries. It is natural that the book will be found incomplete and also wanting in many respects. I shall however be grateful to my readers if they kindly bring these to my notice and also furnish me with any further information on the subject that they may possess, so that I may incorporate them in a future edition.

I take this opportunity also for expressing my thanks to Dr. D. B. Meek, M.A., D.Sc., Director General of Commercial Intelligence and Statistics, Mr. A. T. Weston, M.A., M.Sc., M.I.C.E., M.I.E., offg. Director of Industries, Bengal, Mr. G. S. Dutt, I.C.S., Mr. L. B. Burrows, B.A., District Magistrate and Collector, Faridpur, Dr. H. W. B. Moreno, Editor, the Century Review and several friends for their kind encouragement in my endeavour.

J. K. MAZUMDER.

Kishoreganj,
The 7th July, 1927.

FOREWORD

I need hardly say that it is a great pleasure to write a brief foreword for a book of this kind, chiefly because its appearance supplies additional material to a growing volume of evidence that the indigenous industries of this country are at last receiving the attention of its own intelligentzia. Society in Bengal has, all too long, been organised mainly on the basis of an inheritance of functions. The scope of any individual thus being unalterably determined by his parentage, the village industries—those of the weaver, bell metal worker, blacksmith, shoe-maker etc.—have been excluded from the law of competition and from the stimulus which results from the application of higher trained intelligence to the particular technical and organization problems involved. This state of affairs however happily obtains no longer. Bengal's village industries are passing through a phase of readjustment and in some cases of annihilation; not as is so often and so complacently supposed, because the more organized and stable factory industries are making a frontal attack upon them, but simply from the sheer inevitability of present day conditions. The "shifting" and in some cases the cessation of demand brought about by the existence in the local market of a larger range of quite different articles made in the

world's factories, cheap in price, has had an enormous effect upon the hitherto static conditions of local village industries. Then again, the aggregation of population found in the great and growing cities and the creation of centralised store-purchasing authorities for army, railway, hospital and other State or Municipal purposes, have created problems of supply far beyond the resources of individual craft and village industries,—problems which have only been solved by the concentration of organised manufacturing capacity.

In this way, the quantity, quality and regularity of supply have been factors of the greatest importance, and controlled development. I need not however dwell further on this problem. It is well known and the facts presented in this volume substantiate it. Clearly the only method of solving the problem presented, and of guiding the necessary readjustment of the village industries in this country on right lines, is to develop means for extending the use of small power machines and electric power transmission where possible, so that the smallest craftsman may profit by the use of the most important and valuable labour-saving devices. The policy of the Department of Industries, Bengal, is devoted to this end, though so far the department has been denied the facilities which State-aid-to-Industries Legislation, on the lines advocated by the Industrial Commission, would obviously provide. It is clear also that the Registrar of Co-operative Societies will inevitably have to play an important part in bring-

ing about a greater degree of organization in the village industries. However, before any broad lines of economic policy can be settled, an authoritative review of conditions as they are, is necessary, and such a review this book attempts with a considerable measure of success. Its author held at one time the appointment of Superintendent of Industries, Burdwan Division, and in that capacity helped to lay the foundations of the policy on which the Department of Industries is now working. Bengal needs more young men of similar enterprise and ambition, and I gladly add my tribute to the good work done, in the hope that this book will help to create a much larger interest and unbiassed consideration of the problem.

Calcutta, 12. 9. 27.

A. T. WESTON.
Offg. Director of Industries, Bengal.

CONTENTS.

CHAPTER I.

CHAPTER II.

CHAPTER III.

CHAPTER IV.

CHAPTER V.

CHAPTER VI.

CHAPTER VII.

CHAPTER VIII.

CHAPTER IX.

CHAPTER X.

CHAPTER XI.

CHAPTER XII.

CHAPTER XIII.

CHAPTER XIV.

INTRODUCTION.

All the well-wishers of this country, of whatever political denomination, agree that her future well-being must depend on her economic salvation. The agriculture, which has for all time been the principal industry and the mainstay of this country, has not progressed satisfactorily with the advance of time. This fact has long been realised in responsible quarters and efforts are visible in the Pusa Agricultural College and the Provincial Agricultural Departments to cope with the situation in the light of modern scientific attainments. The appointment of a Royal Commission to enquire and report on the agricultural conditions of India is the most recent event in her economic history.

COTTAGE INDUSTRY OF THE PAST.

But one cannot in this connection lose sight of the importance played by the various cottage Industries in the past economic prosperity of this country and the possibilities they contain for the future. They had given employment and bread to thousands of land-less labourers of this country and also supplementary occupation to innumerable others who depended partly on agriculture. They were carried to an excellence and often exhibited human skill which is India's particularly own. The Dacca muslin and 'Cossida' (Demra), the

silks, embroidery and the ivory works of Murshidabad and the Chikon works of Hooghly and 24-Parganas are only some of the instances on the point, so far as Bengal is concerned. It must also be added that these productions of exquisite artistic beauty and fineness which naturally involve extreme intricacy of manipulation were done with the aid of very simple instruments and appliances of local make only. The beautiful designs on silks which were worked by Dubraj Tantubaya of Murshidabad only half a century before with the help of his primitive loom and a number of strings and a few pieces of bamboo could not be imitated on the up-to-date Dobby and Jacquard looms of Europe. I just remember an incident which may appear interesting in this connection. I had once accompanied a European officer, an Engineer and industrialist of considerable repute, to one of our country potters' workshops at Rupnarainpur in the district of Burdwan. The potter turned his wheel and manufactured a beautiful jug in about 3 minutes time. The engineer was simply amazed at his rapidity and skill and the simplicity of his instruments. He had nothing but admiration for Indian skill and said that he had nowhere met with such dexterity of hand.

CAUSE OF RUIN.

But unfortunately those glorious days of the Indian Cottage Industries are long past. The children of the workers of famous muslin and the silks have lost their

fathers' skill. Those who yet stick to their paternal occupation hardly make out a living, while others have turned out into tillers of land or labourers in the mills of Calcutta and other big cities. The results have been disastrous for the country in more ways than one and the question of bread and unemployment now stare all the more hard on the face of the nation. Besides, India now must look to other countries for her clothing, her utensils, stationeries, leather goods and other daily necessities including even toys for children. The reasons which have contributed towards the ruin of these indigenous industries are certainly many and varied. The competition with the foreign mill manufactures, the peculiar fiscal situation in which the Indian manufactures are placed in relation to them, and the want of adaptability of the Indian workers are some of the factors amongst others which are directly responsible for this regrettable decline in our industrial activities.

RESUSCITATION OF THE INDUSTRIES.

But if India is to keep pace with the other countries of the world and to march along in the path of progress, all her lost industries must be resuscitated and she must even find out new avenues for the employment of her children. The resuscitation of the lost and the decaying industries which ought to be one of our most important and immediate programmes is aptly engaging the attention of many leading men. But the problem, which is undoubtedly a very complicated one, has not

yet been approached from its different aspects and the chief obstacle which in my opinion has rendered a satisfactory handling of the situation most difficult is the want of sufficient data such as the necessary information regarding the present condition of the industries, their immediate difficulties and requirements and the possibilities which they have before them.

The aim of the present writer is to lay down these informations as far as they came within his observation extending over several districts of Bengal.

CHAPTER I.

WEAVING INDUSTRY.

For the sake of convenience I shall divide this subject into two parts, namely: (1) Cotton weaving, (2) and the weaving of silk and tusser and deal with each separately. The weaving of wool which is of rather minor importance, so far as Bengal is concerned, and the weaving of jute which has come into use only recently, shall also be dealt with hereafter.

COTTON WEAVING.

This had been by far the most important of all the cottage industries in Bengal and does yet continue to be so at the present day. It is only natural that this industry should have occupied the premier position considering that piece goods worth 60 crores of rupees are now imported to India every year in addition to the productions of the large manufactories of Bombay and Ahmedabad while the crude and simple hand looms used to meet the entire demand in the days of yore. At the present day more than 25 per cent. of our artisans are engaged in this industry. Of them the majority are Hindu Tantubayas, while the number of ' Yogis ' (a low class Hindu Community) and

Johlas (or karikars—a class of Mahomedans) is also considerable. The Tantubayas are numerous in the Western Bengal while they are also found in large number in the district of Dacca, Mymensingh and Pabna in the east. The number of Tantubayas in the district of Bankura alone is estimated at more than one lac. The number of 'Yogis' is limited to several thousands in the whole province but the Johlas are found in large number in almost all the districts of north and eastern Bengal. The Tantubayas may be said to have specialised in fine weaving while the productions of the other two communities are generally coarser.

The industry is scattered over the whole of the province and almost every village has its share of a few looms. But there are important centres around which the industry has remarkably grown in quality and volume and where the improved methods of work and the skill of manupulation are conspicuous. Some of such centres at this day are : Santipur and Navadwip (Nadia), Serampur, Arambagh and Chander Nagore (Hooghly), Mankar (Burdwan), Dubrajpur and Tantipara (Birbhum), Andul and Uluberia (Howrah) Simla and Goabagan (Calcutta), Jessore, Madhyakul and Keshabpur (Jessore), Deora (Faridpore), Dacca and Dhamrai (Dacca), Tangail and Kishoreganj (Mymensingh), Uzirpur and Banaripara (Backerganj) Feni and Begumganj (Noakhali), Mainamati (Tipperah), Cox's Bazar and Rangamati (Chittagong) and Pabna.

There is often a large number of villages around a centre in all of which the industry is carried on vigorously. In Serampore the industry is carried on in the villages of Begumpur, Haripal, Dhania Khali, Gopinathpur, Atghara, Parialpur, Banigachi and a host of other villages but the products which are generally fine fabrics pass in the market by the common name of ' Farasdanga.'

Very fine counts of yarn are worked at some of these places. The Dacca 'Saris,' which are her speciality now-a-days after the extinct of the fine muslin industry, are much appreciated by the ladies of our middle and upper class societies. They are woven with yarns ranging between 80 and 300 counts and the borders are often ornamented with ' zoree ' (pure and sometimes false) in beautiful designs. The 'Zamdani' (or figured) saris of this place are also a great favourite with the ladies. The dhotis and saris of Santipur and Farasdanga (Chandanagore) are also remarkably fine in texture and woven with high counts of yarns. The products of Tangail, Kishoreganj, Pabna, Bankura (Patrasayer), Faridpur (Deora) and many other places, which have come into prominence in comparatively recent times, are also much liked for common wear by the middle class gentry. The coloured or Nilambari saris (generally black, red, yellow, green, blue and ash coloured) which are comparatively cheap, are widely used for common wear. The coarser productions of other places find market

amongst the poorer and the middle class people generally.

The chintz or coating and shirting pieces are also manufactured in many places. This branch of the industry has received a stimulus since the days of the Swadeshi movement and has been steadily growing in volume. The coating pieces of Mainamati (Tipperah) were a favourite in the Eastern Bengal about 15 years before, but they are losing ground inspite of their remarkable durability. The shirting pieces of Bankura manufactured under the auspices of the Bankura Industrial Co-operative Union are beautiful both in design and finish. Similar fabrics are now being manufactured in large quantities in the hand-loom weaving factories started by ' Bhadraloks ' during the last non-co-operation days. Manufacture of these fabrics has several advantages. They require manipulation of coarser and twisted yarns only and they have a readier market. The fine chaddars (summer wear) of Jessore have a ready market all over Bengal while the coarse chaddars (used as wrapper during the winter) of Boktarnagore (Burdwan), Gopinathpur (Bankura) and the 'Binni' of Rouzan (Chittagong) and Comilla are great favourites with the poorer classes, particularly the peasantry. Bed sheets are manufactured in large quantities in Bankura, Birbhum and Faridpur and always find a ready market.

The mosquito curtain chintz of Arambagh, ordinarily known as Howrah Chintz, find their way in all

the nook and corners of Bengal. They are also made in Barasat. The coarser curtain chintz which are made in many districts including Dacca, Faridpur and Mymensingh have local markets only.

Mention may be made here of a special kind of fabric which is made in small quantities at Alunda in the district of Birbhum. They are used as door and window curtains and also as table covers. Only brightly coloured yarns are used in weaving these clothes. The weavers exhibit a remarkable skill in the manipulation by which a dazzling brightness resembling that of mercerised yarn is imparted to the texture. A few pieces of these cloths were once exhibited in a small industrial show which was organised at Tantipara (Birbhum) on the occasion of H. E. Lord Lytton's visit to that small village. The fabrics attracted the notice of His Excellency who was pleased to purchase a few of them.

'Satranch', only of an inferior kind, is manufactured at Rungpur and some other places of the Northern Bengal.

Towels of all varieties, Turkish, Heckabak and Honey comb are now manufactured in handlooms and they are made a speciality in most of the recently started handloom weaving factories. The Serampore Weaving Institute and its branch schools are primarily responsible for the propagation of this branch of the industry. Ordinary 'gamchas' (napkins) and coarse 'lungis' are made almost all over Bengal and large

number of the 'Yogi' and Karikar weavers find occupation in them. The Karikars also manufacture a large quantity of coarse checked saris which are almost universally and exclusively used by the women of the Mahomedan peasantry in the Eastern Bengal.

The actual process of weaving is principally the same in all classes of fabrics, while it is most complicated in the weaving of design or figures and least so in the plain textures. In the weaving of chintz, coating and shirting pieces, towels and 'dosuti' the process of weaving is much the same after the requisite number of healds and pedals have been fixed on.

The preparatory operations are the most tedious part of the whole business. In the ordinary method of weaving in vogue the yarn, after it is purchased from the market, is steeped for a short time in a solution of water and ricegruel. It is then taken out and the skeins are placed round a drum. The warp is then laid out around a number of pegs fixed on the ground in a straight line or circle, generally 11 yards in circumference (for a cloth of 10 yards in length). When a full warp (700 to 800 yarns for a fabric of 40's counts) has been laid out it is tied at both the ends and stretched fully. The size, which is ordinarily rice water or, as at some places, a thick emulsion of boiled rice and water, is now applied to the warp with the help of a large brush. This operation is generally done by a male worker and requires some skill. The sizing should be uniform and at the same time not too

thick and two or more of the yarns should not stick together. The warp is now exposed to light and air so that it may dry up slowly but not get stiff.

It should be mentioned here that at some places, specially where the weavers prepare or rather can afford to prepare large warps of 100 or more yards all at once, the sizing is generally done before the warp is laid out. The whole hanks of yarn are steeped in the sizing emulsion and then reeled off to a drum during which process the excess of the size is removed.

After the warp is dry each yarn is separated from the others by passing it through the reed and then the alternate yarns are further separated by passing them through healds. Two healds are ordinarily required for weaving the common texture, but the 'Karikars' in the Eastern Bengal use only one, one of the pegs used in laying out the warp answering the purpose of the other. These operations being complete the warp is wound round a beam while one end of it is fixed to another beam with the help of the end peg of the warp. The reed is fixed to the sley which is the main limb of the loom or the weaving machine. The healds are so fixed that they may be pushed down alternately by the foot thus making passage for the shuttle to lay the weft between the alternate yarns of the warp.

After the warp has been thus fixed and the shuttle is ready with a bobbin *i.e.*, its supply of yarn for the weft, the weaver begins the actual operation of weaving. The shuttle in the ordinary fly-shuttle loom is

worked by a jerking push imparted by two square slabs of wood striking at its ends. With his right hand the weaver manipulates a string which makes the wooden slab to strike the shuttle and send it flying to the other end of the sley.

The operator presses down a pedal by his foot which working on one of the healds separates the alternate threads of the warp. His right hand manipulates the string mentioned above and the shuttle lays the weft between the threads of the warp. His left hand now pulls the sley forward which beats the weft. The sley is then released and the same operation repeated, the other pedal being worked upon this time. Thak-a-thak, thak-a-thak, the operation now goes on until the bobbin is used up when it is replaced or a thread snaps accidentally which is also mended readily. When the texture grows appreciably in length it is wound round the beam.

I have mentioned already that the preparatory operations are very tedious. They are also lengthy and absorbs good deal of labour. This portion of the work, except sizing, is generally done by the womenfolk and the children. The weaver is engaged with his loom for all the time available and is generally a hard-worker. He works for 8 to 10 hours a day and may even continue till late at night if the market is good. An average trained weaver can turn out five yards of cloth (40's counts) per diem. His remuneration or 'Bani' for this piece of work is approximately Re. 1

according to the present rates. His monthly income is therefore about Rs. 30 calculated at this rate. But allowance must be made for the time which he is required to devote for such preliminary operations as sizing and beaming etc. and the marketing of his products and purchasing his supply of yarn. Allowing 5 days in the month for these operations the weaver has 25 days left for working on the loom. His monthly income therefore comes up to Rs. 25. But this again should be more properly considered as the income earned by a weaver's family, as unaided by his family members the weaver can hardly expect to make an out-turn of half as much as he ordinarily does. In some of the districts of Western Bengal, namely, Burdwan, Birbhum and the Arambagh subdivision of the Hooghly district the weavers (Tantubayas) are generally less active than their brethren elsewhere and they do not leave alone any opportunity of enjoying a holiday every now and then. The average income of the weavers of these parts is actually less than the estimate I have arrived at.

Now, in these hard days of economic strain and prevailing high prices the industry, as it is carried out, does not afford attractive occupation to many. It is only natural that a large number of the Tantubayas, who hold a fairly good status in the Hindu Society and has a corresponding standard of living, should be induced to give up their paternal vocation for more lucrative occupations. But there are others who are

not in a position to do so and who find themselves in the midst of a struggle which is sucking their very life-blood.

There is no gainsaying that the condition of this country has changed immensely since the glorious days of the indigenous industries. New factors have crept into our economic, social and political life over which we have little or no control. But there are difficulties which may be eliminated and which, if so done, are calculated to substantially improve the condition of this industry. I shall now deal with some of these defects in the lines that follow.

(1) Tools and appliances: Flyshuttle pit looms of the Serampore type are now in vogue in most of the weaving centres of Bengal. The old throw shuttle looms are also in use at many places, particularly where the weavers partly work on silk when the market is favourable for the same. The fllyshuttle is a distinct improvement over the old type and it is generally recognised as such by all classes of weavers. The out-turn in a flyshuttle loom is approximately 50 per cent. more than that in an antiquated loom.

These looms are now manufactured in many places by the village carpenters, but the shuttles and bobbins are made only in factories. Bamboo reeds are manufactured at some places by the village artisans. The cost of a pit loom complete with accessories is about Rs. 40 and it lasts for nearly 10 years with occasional

repairs. The cost of repairs may be estimated at Rs. 3 per annum on the average.

The flyshuttle looms should entirely replace the old type looms for better efficiency and larger outturn. The notion that yet exists with some of the weavers that flyshuttles are not suitable for working with very high counts of yarn and also with silk and Tusser, is erroneous. In the weaving factory of Mysore State Government the flyshuttles are extensively used for the weaving of silk. This has also been demonstrated by the Bengal Department of Industries at Tantipara (Birbhum) and a few other places. Wider demonstrations of this kind will dispel the last traces of antipathy that now exists towards the wholesale introduction of flyshuttles. There are however some who can not replace their paternal looms owing to the initial expenditure which it involves. They are ready to purchase these machines if available on hire purchase or easy payment system.

The process of warping in vogue, as I have described before, absorbs good deal of labour and time. It is a serious handicap to larger outturn. The introduction of hand power warping mills is a satisfactory solution of this difficulty, but unfortunately these machines are not within easy reach of the financial resources of many of the weavers. Besides, most of the weavers can ill afford to buy sufficient yarn in one instalment for a long warp. So efforts for the introduction of warping mills should be preceded by suit-

able arrangements for the supply of necessary yarn to the poor weavers.

It will not be out of place to make here a brief mention of the hand power looms such as the Hattersley's, Raphael Bros' etc. They have been found by experience to be unsuitable for use by the cottage workers, not only because they involve high capital outlay but also on account of the great difficulty of working them. The average artisan of Bengal can scarcely work them for 2 hours at a stretch as they call for great physical strength.

The small power loom factories that were started by the Bhadraloks under the stimulus of the non-co-operation movement had very soon to confront difficulties which ultimately brought ruin to most of them. Each of these factories found it necessary to employ a trained mechanic to run the engine, at a cost which was a great burden to many of them. All important repairs had to be done at Calcutta as there are scarcely any workshops in the mofussil. This caused extra expenditure and also dislocation of work, sometimes for long periods, with consequent loss of revenue. Besides, all of these factories suffered from labour troubles. They employed professional weavers on comparatively high wages but the work outturned was not commensurate. These people often absented themselves from work to the great annoyance and detriment of the factory owners. All these factors com-

bined to bring about abrupt termination of many of these factories.

The handloom factories which were also started in large number at the time fared comparatively better. They do not involve the question of high overhead charges but they had to encounter the same difficulties of labour. The professional weavers while at home work hard and often late at night and they are substantially aided by their womenfolk and children. But when employed in factories they have to do all the operations themselves while at the same time they do not naturally like to keep to the same hours of work as they do in their own homes. The cost of production is consequently unduly high in these factories and good many of them had to close down after running at a loss for sometime. A few others took to weaving only special kind of fabrics such as coating and shirting pieces, towels, mixed fabrics of cotton anl silk, cotton and 'muga' etc. The margin of profit in these goods is higher than that in ordinary fabrics of common wear—and this gave them better chances for competition in the market. Some of these factories are running now but they may scarcely be said to be prosperous.

(2) Supply of raw material and the disposal of finished goods: The weavers who work independently of the Mahajan purchase their supply of yarn from the local dealers. He is a retail purchaser and does never enjoy the benefit of judicious purchase of raw materials

in the best market. The yarn sold to him is deficient in length and also in strength. But for this handicap he would have certainly competed more successfully with the large manufactories who always buy in the best market the best materials to work with, if they do not prepare their own.

He is similarly handicapped in the disposal of his finished goods. He is obliged to sell them at the nearest market at whatever prices that may be prevailing for the time-being. His fresh supply of yarn and the other necessities of life can only be purchased after he has converted his productions into cash money. These are conditions which must be seriously disadvantageous for any business, not to speak of a struggling cottage industry which has got to compete with the most well-organised and up-to-date manufactories.

A large number of the handloom weavers, particularly of the Western Bengal, work under the local Mahajans. The Mahajans supply the workers with yarn and they take the finished goods allowing the weaver 'Bani' or a remuneration for each piece of work at a fixed rate. Wherever this system of work is in vogue the weavers are entirely dependent on the Mahajan. They are bound to accept the Bani fixed by the Mahajan whatever be the prices prevailing in the market. Where the Mahajan has established this business he is the arbiter of the destinies of all the workers around him and everybody is bound to come within his trammels sooner or later. The condition of

the weavers at these places is really much worse than that where they work independently.

Apparently the best remedy for these difficulties is the creation of stores and sales societies on co-operative basis at all the important centres of weaving. What can be achieved by working on these lines has been amply demonstrated by the Co-operative Industrial Union of Bankura. This institution was started several years before during the Bankura famine by Rev. Brown of the Bankura Wesleyan Mission for giving relief to the Tantubayas who were very hard hit by the famine. He formed the nucleus by advancing some money with which yarn was purchased from Calcutta and distributed amongst the weavers who were willing to work on his conditions. He paid a living wage to the workers, collected their productions and then disposed of them at the Calcutta market to the best possible advantage of the weavers. The profits accumulated and with that the advance money was gradually paid off. In course of a few years the entire business was financed by the weavers themselves and the working capital was increased several fold. The rate of wage or ' Bani ' was gradually increased as the funds permitted and the profits at the end of the year were divided amongst the workers. The institution was afterwards registered under the Co-operative Societies Act. Rev. Brown established business connection with several respectable firms of Calcutta including the Army and the Navy stores who were regular customers of the Union during

the last great War. He introduced new designs and varieties of textures which have secured a constant market for the productions of the Union. About 600 weavers work under this Union now and its transactions amount to more than a lakh of rupees annually.

This is undoubtedly a glorious achievement for a co-operative organisation of this kind. Others if started and worked with similar spirit and selfless devotion of Rev. Brown and his assistants, notably Prof. J. C. Banerjee of the Bankura Mission College, may well aspire to meet with similar success. I found Miss Hardinge of the Episcopical Methodist Mission of Mankar (Burdwan) organising a similar institution with the helpless weavers of Mankar in the year 1922-23. Unfortunately I could not keep myself in touch with the future developments of that laudable endeavour.

(3) Introduction of new Designs: I have already referred to the importance of introducing new designs if the handloom weavers were to hold their own against the mill productions. But the weavers as a class very often display unreasonable reluctance to the adoption of anything new. Their apathy has got to be removed and all attempts at this direction should be made through organised institutions of the kind I have mentioned above, if they are to succeed.

(4) Education of the Handloom Weavers: All classes of handloom weavers, the Tantubayas, the Yogis and the Karikars are proverbially stupid and ignorant. They are as a class illiterate. The weavers of Western

Bengal are generally improvident and highly unreliable. The lack of adaptability which they exhibit is the direct outcome of their stupendous ignorance. The question of the improvement of the economic condition of the weavers must necessarily involve a solution of their educational problem. Primary and also technical education should be extended to them freely and also liberally.

I may mention here for the benefit of those who may be willing to work in this field of social service that the weavers are apt to look on with suspicion and also to repel all activities calculated to interfere with their affairs. But they have been found to respond when they are convinced of the sincerity of purpose, honesty and the sympathy of the intruders.

Weaving of Silk and Tusser.

The weaving of 'khamru' or Mulberry Silk is confined only to a few places in the province of Bengal. The largest centre is Vishnupur in the district of Bankura where nearly 2000 looms work regularly on this stuff. There are other smaller centres such as Baswa, Bistupur (Birbhum), Memari, Radhakantapur (Burdwan), Birsingha (Midnapur) Balidewanganj (Hooghly), Khagra, Baluchar, Mirzapur (Murshidabad), Shibganj (Maldah), Malatinagor (Bogra), Cox's Bazar (Chittagong), and Rangamati in the Chittagong Hill tracts.

Several varieties of cloths are woven at these places, the principal amongst them being long ' Saris ' (used by the ladies in the up-countries), Muka turbans, Chaddars and ' thans ' for coating and shirting. Saris with ornamental borders and also figured are woven at Vishnupur, Khagra, Baluchar and Mirzapur but the productions are limited in quantity. Very excellent designs are yet worked at these places, though only on orders. The Bandana or the Carmichael handkerchief (of fine silk with printed designs in dazzling colours) of Murshidabad has of late come into prominence owing chiefly to the attention which it attracted of Lord Carmichael, the late Governor of Bengal.

The raw material (silk yarn) is supplied almost exclusively from the district of Maldah where the reeling of silk is carried on in a large number of villages on country ' ghais.' There are also a few filatures in the district of Murshidabad and Maldah but their productions are generally exported to foreign countries. The yarn, after it is purchased from the market, is bleached with soda or ash and then sized, ordinarily with an emulsion of ' khai ' or fried rice in hot water. The subsequent processes of warping and weaving are almost similar to that employed in the weaving of cotton.

The weaving of Matka is also an important industry in the district of Murshidabad, Rajshahi and Maldah. The yarn spun from the pierced cocoons is called Matka. It is a beautiful stuff and also highly durable.

The coating and shirting pieces and the saris of Matka are highly appreciated by the gentry of Bengal.

The weaving of Tusser is an important industry in the districts of Birbhum, Bankura, Midnapur, Burdwan and Hooghly. There are at least one thousand weavers in the villages of Tantipara, Karidda and Kalipur in the district of Birbhum who work exclusively on Tusser. It is also carried on at Vishnupur (Bankura), though not as extensively as the weaving of Mulberry Silk. Other centres are Raghunathpur (Bankura), Anandapur (Midnapur), Mankar (Burdwan), Balidewanganj and Radhaballavpur in the district of Hooghly.

The principal varieties of cloths woven are dhotis, saris and chaddars. They have a fairly good market amongst the Bengalees, particularly the Hindus of the Western Bengal who wear them on religious and ceremonial occasions. The nuptial costume of the bride and the groom is indispensably made of this stuff at some places. No kind of design or ornamental work is generally done in Tusser but during the last several years the weaving of coating and shirting pieces (plain and striped) have been introduced amongst the weavers of Birbhum.

The Tusser cocoons which grow wild are generally obtained from Dumka, Giridhi, Chaibassa and several other places of Chhotanagpur. The weaving centres are now and then visited by Beparis who deal in them when the local mahajans and the richer weavers, who can afford to do so, purchase their supply. The process

of reeling is almost similar to that employed in the preparation of mulberry silk but the process of bleaching and dyeing are almost unknown.

Like Matka 'kete' is the stuff spun from the pierced cocoons of Tusser. It is very strong and durable though not as beautiful as Matka. Chaddars of kete are woven at Bankura and Bishnupur and they have a local ready market.

Several varieties of mixed fabrics of cotton, silk and also tusser are woven at some places. One of them is the Rangina, a mixed fabric of cotton, silk or tusser in bright dazzling colours, of the Hooghly district. It is produced in limited quantities at Balidewanganj, Udayrajpur and Mandaran in the Arambagh Subdivision. The fine 'Katari' of Shahpur (Maldah) is a mixture of silk and cotton generally dyed black. The warp is made of silk and the weft is cotton of high counts. They are woven in thans of 8 yards and are exported to the Bombay market from where, it is said, they ultimately find their way to the Persian Gulf and Jedda. The mixed fabrics of cotton and silk are also woven in fairly large quantities at Cox's Bazar, Ramu, Maishkhali and a few other places of Chittagong and at Rangamati in the Chittagong Hill tracts. The weavers are generally 'Mug' women who in accordance with a time honoured custom clothe their people with the productions of their own looms. Only the surplus stuff, which must necessarily be limited in quantity as the weavers can work only during their

spare time, go to the markets of Akyab and Rangoon. The silk 'lungis' of these places are famous for their durability and good finish.

The monthly income of a silk weaver (or rather his family—as he is substantially aided by his women folk and children) may be roughly estimated at Rs. 30, but at some places *e.g.* Vishnupur, it is generally more than that. The tusser weavers are comparatively better off than the mulberry silk weavers as they suffer less from the fluctuation of prices and the competition of foreign market. The income of the weavers may, however, be substantially increased even in the present conditions under which they work, if only they would work to their full capacity. Most of the weavers are lazy and will never let alone an opportunity of enjoying a holiday. The silk weavers are mostly Tantubayas.

The silk industry of Bengal is in its decline owing chiefly to the want of efficient business organisation and adaptibility on the part of the weavers. Foreign silk is slowly but steadily ousting the indigenous products from the market by virtue of their superior finish and comparatively cheaper prices. The indigenous stuff inspite of its high durability and genuineness is falling into the background. The uniformity of texture is a thing rarely to be met with in the productions of our weavers and they scarcely realise that the fineness of a stuff must necessarily depend largely on the use of the proper danier and uniform threads. The yarn reeled in the country method is highly defective in this res-

pect. The method of dyeing is also not scientific. The weavers of many places, particularly the Tusser weavers of Birbhum and Bankura, have no knowledge about the use of dye stuffs.

The tools and appliances employed by these weavers are of the most primitive type. The old throw shuttle looms are in universal use and the weavers are under the strong impression that the flyshuttle looms cannot be used in the weaving of silk as the incidental strain would be too hard for the delicate yarns. This is however an erroneous impression and need be removed at the earliest opportunity. Demonstration of silk weaving in flyshuttle looms at all the important centres of weaving is the best way to remove this impression. The introduction of the fly-shuttle will increase the outturn and so afford better chances for competition in the market. Labour saving devices such as the Dobby and the Jacquard looms which have been adopted by a few rich weavers of Vishnupur should be introduced more extensively wherever possible. An up-to-date and well-equipped institute for silk weaving (of the Serampore Weaving Institute type) is likely to go a great way in effecting these improvements and in introducing modern designs. This will also create facilities for the training of the youngmen of non-weaving communities who may be willing to take to this industry as their vocation in life.

The Mahajan or the capitalist is the central figure in the industry of silk weaving. This is naturally so,

as it requires a much bigger capital than in the weaving of cotton for carrying on the business independently and stocking the requisite quantity of raw material in the best season. Besides, the market for silk is not ready at hand and one must have business connection with the dealers of distant countries for disposing of the goods. The weavers generally work on the ' Bani ' system and the raw material is supplied by the Mahajan. The system has not been conducive to the best interest of the weavers and they have been gradually enslaved to the Mahajan.

WEAVING OF WOOL.

The weaving of wool does not appear to have been an important industry at any time in the province of Bengal. It is confined to a few places such as Bankura (Suburbs), Asansol, Berhampur (Suburbs) and Jangipur in the Murshidabad district. Only coarse blankets of inferior kind are woven at these places and the productions are limited in quantity.

The industry is generally carried on by a class of people called "Bheriwallas" who are migrators from the upcountries. Most of them possess flocks of sheep from which the raw material is obtained, while others purchase it from the market. The wool, after it is fleeced, is thoroughly washed and dried in the sun. It is then carded and spun in ' charkas ' of primitive type. The spinning is done exclusively by women

while the men engage themselves in the weaving operation. The loom consists only of 2 healds which are pulled alternately and weft is laid in between them by the hand. The weft is then beaten into position by an iron comb. The width of a piece as it is woven is very small but several pieces are stitched together afterwards to make a blanket of the usual size. They sell from Rs. 2-8 to Rs. 7 each according to size and texture and have often ready market on the spot, particularly in the winter season; and at other times they are sold to the traders of neighbouring marts. A weaver can earn about Rs. 25 per month with the help of a spinner who is ordinarily a female member of his family.

The industry is generally free from the Mahajan's control except for the disposal of finished products. The introduction of the flyshuttle loom would perhaps be a desirable improvement as the method of weaving is crude and slow, but this cannot be effected unless some sort of size is used for the threads of the warp.

WEAVING OF JUTE.

The spinning and weaving of jute as a cottage industry is practically a new enterprise. It is carried on in several villages of the Narayangunj and Munshiganj Sub-divisions of the Dacca district, at Gournadi, Chandsi, Barthi and a number of other villages of the Backerganj district, at Sadar, Kashba and Nabinagore Thanas of the Tipperah district and at Nateswar in

Thana Begumganj of the Noakhali District by a class of people, called 'Kapalis' who are low caste Hindus. In the Northern Bengal it is scattered over a number of villages in the Nilphamari Sub-division of the Rangpur district and is carried on by the Mahomedan cultivators and their women folk. All the weavers are cultivators and they utilise only their spare time in this occupation.

The spinning is generally done with the help of a 'takku' in the primitive method and one can work only about a seer of jute in a day of 12 hours. The weaving is done with the help of 2 healds without any sley or reed, much in the same way as in the weaving of blankets. The usual productions are gunny cloth and bags. The former is used for spreading and also as wrappers by the poorer people. Fine textures can be woven at some of the places but these are done only on order. An ordinary gunny cloth of usual size sells for about Rs. 1-8, but the weaver's remuneration therein does not exceed annas 8. A cultivator with the help of his family members can earn Rs. 5 to Rs. 7 per month if he utilises his spare time fully in this occupation.

The industry has not made much headway inspite of good possibilities, owing chiefly to the prices which do not compare favourably with that of the mill made gunnies. But the introduction of a suitable Charka for spinning and the fly-shuttle loom for the purpose of weaving will at once increase the outturn and lower the cost of production, ensuring a higher margin for

the weavers. There is absolutely no difficulty for obtaining the raw material at a reasonable cost and the market for the finished products is also extensive. The Bengal Department of Industries has been successful in designing a suitable type of charka which was demonstrated together with fly-shuttle weaving at some of the centres of Backerganj and Noakhali. The demonstrations are said to have been much appreciated by the weavers and as a result a number of the improved appliances were introduced amongst them. Similar demonstrations, if held at all the important centres of weaving, will substantially improve the condition of the industry. There is caste prejudice against the industry at some of the places.

Tape and Newar Weaving.

This industry is confined only to several villages of the Howrah district where the Mahomedan women work on it in their spare time, when there is demand in the market. The raw material is purchased from the market in the form of grey and dyed yarns of low counts. They are worked in smalll looms which are only a special contrivance for the purpose. There is no sley or reed, the operation being conducted with the help of 2 healds in the same way as in the weaving of wool and jute, though in a miniature scale.

The demand for these goods is limited, owing chiefly to the large supply from foreign countries which is comparatively cheap in price.

SATRANCHA WEAVING.

This is carried on at Nisbetganj and a few neighbouring villages of the Rangpur district by the Mahomedan cultivators in their spare time. The method of weaving is the same as that employed in the weaving of blankets and gunny with this difference that a full width is woven at once instead of in parts. Consequently two or more men are required to work simultaneously on the same piece and rate of progress is very slow. The productions are generally coarse and of an inferior kind. A cultivator with the help of his family members earns about Rs. 10 per month in this occupation.

The raw material is purchased from the market in the form of yarns of 8 to 10 counts. They are then dyed blue and red by the weavers themselves with aniline dyes. Some of the cultivators grow indigo plants on their own lands which they use for dyeing. The primitive method of dyeing by reducing indigo paste with ash, lime and molasses is yet employed.

CHAPTER II.

BRASS AND BELLMETAL INDUSTRY.

The manufacture of brass and bell metal wares is an important indigenous industry of the province of Bengal. The number of persons who find occupation in this industry is correspondingly large and they represent almost all the lower classes of the Hindu community, such as Handis, Doms, Bauris, Bagdis and Bairagis, besides the Kangsabaniks and Karmakars who are the 'bonafide' braziers of Bengal. In recent years some Mahomedans of the Dacca, Maldah and Rajshahi districts have also taken to the industry.

CENTRES OF MANUFACTURE.

The more important centres of manufacture are: Bankura, Vishnupur, Kenjakura Patrasayer (Bankura); Dubrajpur, Nalhati (Birbhum); Kharar, Raidanga. Udoygunj, Patnabazar (Midnapur); Kalyanpur (Howrah); Kansaripara (Calcutta); Basirhat, Baduria (24-Pergs.); Navadwip, Ranaghat (Nadia); Keshabpur (Jessore); Khagra (Murshidabad); Englishbazar, Nawabgunj (Maldah); Budhpara, Kanaikhali, Kalam (Rajshahi); Lohajang, Firringibazar, Abdullahpur, Shologhar, Dhamrai, Thatari Bazar (Dacca); Islampur, Kagmari (Mymensingh); Palong (Faridpore); Brah-

manbaria and Ramchandrapur (Tipperah). Of these places Vishnupur, Khagra, Englishbazar, Kagmari and Islampur are famous for high class manufacture and artistic skill. But the industry is more concentrated at Kharar and the neighbouring few villages of the Midnapur district where there are more than 100 workshops, each employing about 50 men in the average. All these workshops are owned by local Mahajans who directly participate in the industry. In most other places small workshops each employing 7 or 8 persons are run by workers themselves, the owner being the headman of the group. The following alloys and metals are ordinarily worked upon at these places: (1) Bell metal, (2) Brass and Bharan, (3) German silver and (4) Copper.

BELL METAL.

Bell metal or kansa is a definite alloy of tin and copper (2 :7) and is used for the manufacture of dishes, plates, cups and glasses *i.e.*, wares of such shapes as may be beaten out and do not require soldering and casting. Broken pieces of kansa collected by Beparis from mofussil form the starting material at most of the places while at bigger centres of manufacture, such as Kharar and Vishnupur, the raw materials *i.e.*, copper and tin are obtained from Calcutta and sometimes from Japan and Strait Settlements at wholesale rates, in the form of ingots. The broken pieces or the

component metals are melted in earthen crucibles by charcoal firing and then the molten mass is poured into a number of earthern vessels for solidifying in separate lumps. Each of these lumps forms the material for a separate utensil.

The alloy is then heated in a forge and when red hot is beaten with hammers on an anvil. When cold the mass is again heated and then beaten. The alternate processes of heating and beating go on until the mass is given the desired shape and size. The process of beating out is a difficult and laborious one. 4 or 5 men alternately strike on the red hot metal with sledge hammers while another, who is generally the headman of the group, holds and manipulates the mass on the anvil.

The utensil is now scraped with a hand scraper. It is then fixed to the mandril of a headstock with a composition of lac and rosin. The mandril is revolved by pulling at the ends of a string wound round it, which gives it a reciprocating motion. While it is revolved another skilled worker manipulates a sharp scraper and thus carries on the process of spinning. This done the article is subjected to the final operation of polishing which is done by rubbing it with cocoanut or jute fibres besmeared with an oily stuff and also some mineral acids. After this the article is ready for the market.

BRASS.

Brass is an alloy of copper and zinc, but the composition as worked at different places varies considerably. There are two methods of manufacture in vogue; (a) by casting into moulds (b) by beating out the brass sheets obtained from the market. In the first method, which is specially suitable for the manufacture of water jugs and cooking vessels etc., the molten alloy is cast into moulds of requisite size and shape and when cold the articles are scraped and turned in the same way as the bell metal wares are done. The moulds are prepared locally by women from earth sprinkled with rice husk. The outer wall is made from a model in 2 or 3 different parts and the core, which is first made to fit it, is uniformly scraped to make room for the alloy. The different parts are then joined together and a hole is punctured at one of the ends through which the mould is connected with a crucible of clay which contains the alloy and is sealed after the introduction of the same. The crucible with the mould is heated in a furnace and when the alloy melts the whole thing is turned upside down. The alloy is obtained by melting broken wares or the component elements.

Large quantities of utensils such as water jugs, cooking vessels and dishes etc. are also manufactured by beating out brass sheets which are imported largely from Japan. This method of manufacture is prevalent in many places of the Eastern Bengal where the

workers are ignorant of the method of casting. The beaten out articles are lighter in weight and consequently cheaper for their size though much less durable than cast out articles.

'Bharan' is an alloy of copper, zinc and lead in varying proportions. The method of working is similar to that of brass. The alloy is a cheaper one and much less popular.

German Silver.

The manufacture of German silver wares is a new enterprise and is almost confined to Vishnupur in the Bankura district. The raw material is obtained by melting cupro-nickel alloy with zinc (55:45). The cupro-nickel alloy was available in large quantities (scrapings) in Munition Board sales during the latter part of the last Great War and this served largely as an impetus to this industry. The processes of manufacture are similar to that employed in casting out brass wares. The German silver wares are fast gaining in popularity.

Copper.

Copper utensils for Hindu religious purposes and also cooking vessels (chiefly used by Mahomedans) are manufactured at some places, including Kansaripara, in Calcutta from imported copper sheets. The cooking vessels are tinned inside, the operation being done by the "Kallywallas."

As I have mentioned already, the whole business in these wares is conducted by the Mahajans, while at some of the places such as Kharar, Raidanga and Udoyganj i.e., where the industry is carried on in well organised factory scale, they directly participate in it. The artisans at these places work on daily wage ranging between As. 6 and Re. 1 per diem of about 8 hours, in accordance with the nature of the work to be performed and individual skill therein. A few of the workmen who are specially skilled in their work earn more than Re. 1. In most other places where small workshops are run by the workmen themselves, the headman receives his supply of raw material from the Mahajan and to him he returns the finished products, weight for weight, no allowance being generally made for the loss due to operations. The price of labour or 'Bani' is paid to him at certain fixed rates on the weight of the material. This he shares with his co-workers in proportions fixed by local custom. The average earning of a worker in these shops is about Rs. 20 per month and that of the headman Rs. 7 or Rs. 8 more. Most of the workers are highly indebted to the Mahajan and they are not consequently free to do or move as they please. The braziers of Khagra (Murshidabad) are comparatively free from the trammels of Mahajan while the rate of Bani at this place is also higher than what obtains at most other centres.

The prevailing methods of work are crude and old fashioned. The process of beating out bell-metal

warės is an extremely laborious and exhausting one. It requires 6 or 7 men to work simultaneously on a piece of metal and in a short time they all begin to perspire. Again, if a few of the workers of the group are perchance absent from work the operation cannot go cn and those present must idle away their time or do some less important work. These are serious drawbacks and must hamper the progress of the industry. The introduction of simple mechanical hammers (treadle) of suitable type is likely to meet the situation, but necessary experiments must precede any attempt to do so. A few years before a hammer of the type was discovered in a factory of Messrs Herbert Spencer and Co., which with slight alteration might be adopted for the purpose. The Department of Industries, Bengal, then thought of making experiments with the hammer and arranging for demonstration at important centres. Such a hammer is likely to be a bit too costly for the small workshop owners—but if widely adopted it may be possible to make arrangements for the supply of these machines on hire purchase system.

Then again the process of turning and spinning which is done on a premitively designed lathe, requires two men to work at a time, one revolving it and the other operating on the article. The mandril has a reciprocating motion but the article can be worked upon only in one direction. So during the operation half the time is lost without any work being done. This can be obviated by introducing small up-to-date lathes

workable by foot. One can alone work such a lathe and also operate on the article.

The process of moulding in vogue is ingenious though a bit wasteful, each mould being fit for use only once. But considering that large quantities of articles are manufactured of particular sizes and shapes, it may be possible to introduce box moulding with advantage.

The introduction of new and up-to-date designs is another step the importance of which for the improvement of the industry can hardly be overestimated. The workers are generally unwilling to work on any new design but that is due simply to ignorance and the traditional conservatism of these people. The Mahajans, some of whom are educated and intelligent men of business, are the best agency to take up this work. While doing a service to the cause of this old and indigenous industry they will directly benefit by whatever success they achieve in the enterprise. The manufacture of brass and bell-metal wares is an industry which has not yet suffered from foreign competition. Religious sentiments against foreign wares of porcelain, glass, enamel and aluminium, which are yet confirmed amongst the orthodox people of the Hindu Society, are also largely responsible for the universal demand of these commodities. But the English educated Hindus have partially cast away the prejudice and it is probable that others will follow suit ere long. Enamel and aluminium wares have already made their way to Bengalee homes in threatening proportions, owing partly to their

cheapness and partly to handy design and good finish. The manufacturers of brass and bell-metal wares should move with the times, introduce up-to-date designs, ensure better finish and also cheapen the prices. The adoption of improved methods of work will lower the cost of production while new and up-to-date designs will create markets for them. The wares of Bengal are at present largely exported to Chota Nagpur, Orissa and also Behar. But there is no reason why the markets of Madras, Bombay and other places should not be captured. Here is an opportunity also for some of our enterprising Bhadralok youths.

The lot of the actual workers is undoubtedly hard. Co-operative organisations for the supply of raw materials and the disposal of finished products are likely to prove beneficial to them but this is a difficult undertaking considering their high indebtedness and also the fact that it requires a fairly big capital to carry on the industry independently. A society on these lines is reported to have been working under the Nator Central Bank in the district of Rajshahi with conspicuous success. At present the Mahajan is the central figure in the business and he invests large sums on it. He gets a return generally of 15 to 20 per cent. on the capital, but his risks are also many.

CHAPTER III.

MANUFACTURE OF LEATHER AND LEATHER ARTICLES.

This is an ancient industry in Bengal though unfortunately yet largely in the primitive condition. The reasons which have contributed towards the moribund condition of the industry are many, but the chief amongst them is the caste prejudice against it—the industry being confined only amongst certain lowest classes of the Hindu society, the Charmakars, the Rishis of Eastern Bengal and the Muchis who have long migrated to Bengal from the up-countries. These social 'Pariahs' are generally illiterate and also very poor and they lack in the imagination and resources which are required for the improvement of the industry on which depends their livelihood.

In almost all the districts of Bengal there are isolated groups of Muchis, Charmakars and Rishis to be found here and there carrying on the leather industry. Most of them do a certain amount of hide curing for export purposes, while a good many tan leather in the country method for the manufacture of shoes, slippers and other leather articles of local demand. The hides and skins are often obtained locally from carcasses of buffaloes, cows, calves and goats for which generally nothing has to be paid. These are sometimes

also purchased from the butcher's shops which exist in towns. In the cities of Dacca and Calcutta and also in the neighbourhood the supplies are purchased from the hide dealers.

TANNING METHODS.

The tanning materials are many and varied. They comprise Myrabolans, Babul and Arjun barks, Goran, Temasi, Dhawpat, Amlapat, Sonali and several other vegetable matters rich in tannin. The skins and hides are first thoroughly washed in water and then a thick paste of lime is applied to the flesh side of them. They are left in this condition overnight and next day steeped in lime solution contained in small pits or earthen tubs. The treatment continues for 2 to 4 weeks according to the kind of the raw material, while the strength of the lime solution is increased gradually by the addition of fresh lime. They are then taken out, washed and the hair is removed by a knife. The adhering bits of flesh are also scraped off by a sharp knife called 'khurpi' after spreading the hides over a beam (preferably of palmyra) with the flesh side above. They are now steeped in water for a day or two while bran is also added to it at some places. After washing again the hides and skins are arranged into the tan pit, each piece being separated from the other by a thick layer of the crushed tanstuff, a mixture of 2 or 3 or more of the materials mentioned above. The pit is then filled with water The treatment continues for 2 to 8 weeks or more

according to the nature of the raw material and the finished product required. At some places after a short treatment in the pit a different method is resorted to for completing the treatment. Each hide or skin is sewn into a bag and then filled with tanstuff and water and suspended from boughs of trees for 2 or 3 weeks. After these operations they are considered to be tanned and ready for use. Some of the leathers are dyed black or brown for use as uppers. The buffalo hide leathers are generally used as sole leather.

This is the general outline of the country method of tanning in vogue though the variations from place to place are considerable. The operations are very often carried out haphazardly without due regard for the quality and the economic and proper use of the tanning materials, the period of treatment and other essential details. Methods of finishing are practically unknown while those of dyeing are also very crude. The result is that the leathers are often insufficiently or only half-tanned. Articles manufactured out of such material become stiff in course of use and also lose shape before long. They find market only amongst the poorer village folk who buy them for cheaper prices.

There is no organisation amongst the village workers and each man works separately for meeting his own needs of leather for the manufacture of shoes and slippers etc. Many of them purchase their supply of leather from Calcutta or other markets. The manufacture of shoes and other leather articles is their prin-

cipal occupation and the tanning of leather is only an intermediate step. The income of a fairly hardworking Charmakar is only Rs. 15 to Rs. 20 per month and on this generally depends the maintenance of himself and his family.

There is a great scope for tanning in Bengal, both as a cottage industry and also on small factory scale. The local supply of vegetable tanning materials is almost unlimited and they are procurable at a comparatively small price. Hides and skins from Bengal are exported in large quantities to foreign countries from where a substantial portion of them again come back to this country in the shape of finished goods and find market here inspite of high export and import duties on either way. This certainly indicates a favourable position which should be turned into better account. The numerous small leather factories in the south-eastern suburbs of Calcutta, which have come into existence only in recent years, are doing fairly good business inspite of foreign competition and other disadvantages of small scale manufacture.

The problem of the village Charmakars is primarily that of education into the better method of work. This is not however a very difficult task to achieve considering that they have the experience of ages behind them. It has been found out that simple demonstrations into the up-to-date method of vegetable and also chrome tanning at important centres of work have conduced to very good results. If these demonstrations are con-

tinued for fairly long time at a place and ably managed, many of the charmakars easily pick up the necessary points. Chrome tanning, which is a scientific method of much recent invention, is altogether foreign to our workers. But, as the result of a demonstration held at Bankura in which the local charmakars evinced keen interest, a few of the workers started chrome tanning on their own account. There was of course no arrangement for glazing the leathers but they could use them for lining and also as uppers for inferior shoes of local demand. In another instance a Charmakar's son of Tantipara in Birbhum was brought down to Calcutta and trained in the Government Research Tannery for several weeks. On return home he started a small tanning business for himself on scientific line.

As regards organisation of work, I have mentioned already that there is none existing amongst the village workers. For vegetable or bark tanning the equipments necessary are but few and each worker may form a unit by himself if only the small capital required is forthcoming. But in chrome tanning where finishing, particularly glazing, forms an important part some costly machineries including a power engine is necessary. This is not within the individual means of our village workers and may even be too much for small co-operative organisations that may be formed amongst the workers of a village or two. For the present this difficulty can be met by arranging with the Government Research Tannery or any other well equipped chrome

tannery of Calcutta for finishing the productions of village workers. The Research Tannery may even undertake to sell off the finished goods on account of village associations or send them back if so required.

LEATHER ARTICLES.

The manufacture of footwear, as I have mentioned above, forms the more important part of the occupation of our workers. The Charmakars of Nutan Chati (Bankura), Asansol (Burdwan), Tantipara and Suri (Birbhum) and the Muchis of Goabagan, Rajabagan, Thanthania and many other bustees of Calcutta, Rangpur town, Lakshmibazar in Dacca, Anderkilla in Chittagong and several other places turn out excellent boots and shoes. Harness, saddlery, belts, suit-cases, money bags and other leather articles are also manufactured in Calcutta. The workers of mofussil generally have ready market amongst the local gentry but some of their productions are also imported to Calcutta, mainly through middlemen who have been out recently to explore this field of business. These middlemen, mostly Punjabis, carry on the double business of supplying leather to the workers and also of purchasing their productions for the Calcutta market. They are a growing danger and should be weeded out before they have a firmer hold upon the workers, who are mostly ignorant people. The supply of leather and the disposal of finished goods may with advantage be taken up by co-

operative societies or similar associations of workers themselves. Such institutions may also render useful service in other ways, as by the purchase of sewing machines and costly equipments for the joint use of the members.

Most of the Charmakars, however, lack in training for the manufacture of better class footwear and other leather articles which are largely used now-a-days. Such training may also be given to them through demonstrations at important centres of work. In fact several Charmakars of Tantipara were trained in the manufacture of cigar and cigarette cases, purses and leather bags a few years before in this way. Provided that they get good leather they can turn out fairly good articles which will find market amongst the fashionable customers of Calcutta and also mofussil.

The manufacture of leather and leather articles by scientific and up-to-date method also offers good scope for the employment of Bhadralok youngmen who are keen on an industrial career, with comparatively small capital. Such manufactories can be started on varying scales. Very useful information on this point will be found in bulletin No. 15 of the Dept. of Industries, on the subject. A short course of training in a factory into the actual methods of work will be a valuable asset to an adventurer in this line.

CHAPTER IV.

MANUFACTURE OF HARDWARE.

Cutlery.

The manufacture of high class cutlery is now confined only to a few villages in Bengal, namely, Kanchannagore (Burdwan), Shahaspur (Bankura), Dubrajpur (Birbhum), Jessore, Kaligunj (Khulna), Uzirpur, Nalchiti, Patuakhali (Backergunj), and Duttapara (Noakhali). The Karmakars of Kanchannagore were at one time highly reputed for the manufacture of fine cutlery including surgical instruments, shaving razors, knives, scissors and other domestic articles of various description. The firm of Prem Chand Mistry of Kanchannagore, it is said, used to supply articles to the value of several thousand rupees annually to the Government stores Dept., in the earlier days. But the industry is in a decaying condition now and the sons of the famous artisans have either lost their father's skill or have been driven to other vocations of life altogether.

There are at present only 15 or 16 families of Karmakars at Kanchannagore who yet stick to this occupation. They run 8 small factories each employing about a dozen men in the average. The biggest factory is that of late Prem Chand Mistry, now managed by his son Gadadhar Mistry. It has got a 3 H.P. Hornsby

oil Engine and a 6 ft. lathe with screw cutting arrangements. The number of workers at other centres of work is not also large. The method of operation is more or less similar in different centres but the organisation at Kanchannagore is probably more scientific than anywhere else. The starting material here is furnished by rejected cast steel files which are purchased in large quantities from the Calcutta shops. The files are first heated in furnace and hammered on an anvil until the requisite thinness is obtained. They are then cut into pieces of necessary size and each is given a definite shape on the anvil. The process of tempering is also carried on simultaneously. The material then passes on to the next shop where necessary holes are drilled on to the iron piece with a sharp driller and a bow string. The next operation is that of putting on a handle which is ordinarily of horn, ivory or metal. The handles are fairly well finished. Next comes the important operation of grinding. The first grinding is done on a comparatively coarser grindstone, generally obtained from Sonamukhi in the District of Bankura. The operation is completed on another stone which is a composition of fine grit and lac. These stones are circular in shape with a radius of about one foot and half an inch in thickness. They are revolved on axles generally worked by pulling alternately at the ends of a rope wound round them. In the factory of Prem Chand Mistry they are driven by power, while in some others treadle wheels are employed for the purpose.

After this operation the articles are subjected to the final process of polishing which is done with a mixture of brick dust, charcoal and oil. The finished articles are then ready for the market.

The manufacture of fine cutlery, as I have mentioned before, is in a moribund condition. This is apparently due to foreign competition. Not that the local productions are usually inferior in quality, but the prices are often a bit too high quality for quality. The solution appears to lie in the introduction of small labour saving appliances such as shearing and drilling machines, treadle lathes etc., which will reduce the cost of production substantially. The supply of skilled labour is also getting scantier every day as the industry has failed to attract new votaries. Some of the cutlers of Kanchannagore are fairly well-to-do and would be willing to purchase small machineries if expert advice were available on that behalf. The articles have yet a ready market in Calcutta and in the mofussil centres of business.

The coarser productions are fairly large in quantity and include knives, scissors, daos, sacrificial knives, daggers, nutcrackers etc. They have generally a ready local market as they are indispensable for domestic purposes. The income of a fairly skilled and hard working cutler working independently ranges between Re. 1 and Rs. 2 per diem. The workmen in the factories of Kanchannagore are paid from annas 6 to Re. 1 per diem

according to the nature of work they perform and the individual skill therein.

... BLACK SMITHERY.

This is a common industry and there is a smith's shop in almost every village in Bengal. The blacksmiths manufacture all kinds of agricultural implements such as plough shares, sickles, daos, iron shoes for bullocks and horses and also other domestic articles of iron. The iron and steel used by them generally come from the United Kingdom and Belgium. The Tata Iron is also being used now-a-days. The average income of a village blacksmith is about Re. 1. per diem.

MANUFACTURE OF TRUNKS AND LOCKS.

Iron safes are manufactured at Ultadanga and Manicktolla in Calcutta by blacksmiths, mostly upcountrymen, who perform all the operations by hand. These safes have a good ready market.

The manufacture of steel and tin trunks, cash boxes etc., from imported sheets is now carried on extensively in Calcutta and many other mofussil towns. The articles find a ready market and the manufacturers make good business out of them. The importation of foreign trunks has now been largely curtailed owing to the impetus which the industry has received of late.

Locks are manufactured at Makardah, Natagarh (24 Parganas); Domjur (Howrah); Dubrajpur (Birbhum) and several other places. The Natagarh

locks are famous for good make and finish but the workmanship at other centres is crude. The cruder articles have however a readier market owing to their cheapness.

Water buckets and tubs are also manufactured at several places from galvanised iron sheets. The products are rather crude but they have ready market owing to comparatively low prices. Tin canisters, kerosine lamps, mugs etc., are also manufactured in large quantities at many places.

CHAPTER V.

MANUFACTURE OF POTTERY.

Common earthenwares of domestic use, such as cooking pots, water jugs, lotas, tumblers, plates, sorais etc., are manufactured almost all over Bengal in large quantities. The industry is an ancient one and is confined amongst a class of people called Kumbhakars or Kumars who occupy a place of some importance in the Hindu social system, particularly as the sacred duty of making Hindu gods and goddesses for worship has devolved upon them from the earliest days of Hindu civilisation.

Unlike most other industries the manufacture of ordinary pottery requires little capital. The raw material *i.e.*, suitable earth, is obtained from the banks of rivers or canals and sometimes from homestead or arable lands for which of course the Kumbhakar has to pay in some shape or other. The other requisite, sand, is also either obtained from alluvial deposits in river beds or purchased from the market at a cost of about annas 4 per maund. The earth is kneaded by hand and in this laborious task the Kumbhakar is substantially helped by his womenfolk and children. His tools and appliances consist of a heavy wooden wheel, a few rods and several flat hammers. The requisite quantity of

clay is put on the axle of the wheel which is placed horizontally on the ground and then turned at a high speed. While the wheel is in motion the operator gives shape to the revolving lump of clay with his hands. In a few minutes a pot is turned out, or the different parts of a big one in which case the parts have got to be joined together later on with the help of the hammers. The pots are then dried in the sun and a paint (generally red or yellow ochre) is applied on them. The final operation of burning is done in an open furnace, fired generally by wood, while coal is also used in some parts of Western Bengal. The furnace is made by digging a big hole in the ground over which a platform is constructed with mud and broken pieces of wares, leaving an opening for introducing the fuel. The pots are arranged on this platform in a pile, each stratum being covered with a layer of mud and straw. The process of burning continues for 6 to 8 hours. The breakage during this operation is high, ordinarily about 25 per cent. of the pots cracking under unequal heating which must happen in a kiln of above description. The cost of fuel is about Rs. 2 for 100 pots of medium size.

The Kumbhakars are generally a hard working people. A fairly hardworking man with the help of his family members earns about Rs. 30 per month in this occupation. The demand for his commodities is about unlimited, the earthen pots being an indispensable domestic necessity with our cultivators and also

the middle class people. Unfortunately however there has been little improvement in the quality or design of the articles since the primitive days when the industry was first conceived. The method of firing, as I have mentioned above, is very defective, the furnace being exposed to external conditions of wind and temperature etc. The modern brick kilns are probably too costly for our workers, but an easy way out of this difficulty is to resort to co-operative methods. A fairly big sized up-to-date kiln may serve the purpose of 10 or 15 families, if so arranged amongst themselves. This will eliminate the breakage, ensure uniform burning and also substantially reduce the cost of fuel.

The manufacture of higher class pottery, such as glazed Terra Cotta wares of Mirzapur, is almost unknown in Bengal. I came across only one such factory at Uttarpara in Hooghly where high class Terra Cotta wares including tea cups, saucers, pots, bowls, flower vases and many other articles are manufactured by local hands. The factory is owned and managed by a rich zaminder of Uttarpara, who is however working it more as a pleasurable occupation than as a serious business concern. The factory has, however, attained considerable success in the manufacture side. The demand for China clay articles, particularly the coarser plates and cups etc., which are used extensively by the Mahomedans of the Chittagong and the Dacca divisions, is considerable in this country but unfortunately there has been little attempt to meet this demand locally. The

Calcutta Pottery Works which is the only one of its kind in the province is busily engaged in contract works for the Government and other large consumers and so has not got time to enter this field of business. There is, I think, good scope for business in this direction which may well employ some of our educated young-men keen on manufacturers' career.

MANUFACTURE OF TOYS AND HINDU IDOLS.

The Kumbhakars manufacture, as I have mentioned above, the images of Hindu gods and goddesses for worship. The demand for these images during the Puja times is considerable and the occupation is a paying one. The Kumbhakars of Krishnagore and Barisal enjoy great reputation for their skill in this art and their services are often requisitioned from far off places. The pigments used for this purpose are imported from foreign countries.

The manufacture of ordinary earthen toys such as fruits, flowers, fishes, animals, human forms and idols etc., is carried on everywhere by the Kumbhakars and the articles find good market during festive occasions. But the potters of Krishnagore (Ghurni), Ranaghat and Santipur are specially skilled in this art. The Krishnagore toys are much appreciated all over Bengal and also outside and they command good sale inspite of rather high prices. Some of the potters of Krishnagore make excellent models, particularly busts, of clay and

plaster of Paris. Bakkeswar Pal and Jadu Nath Pal of Krishnagore are great experts in this art and they make decent income out of it. The modellers sometimes receive orders from Europe and America for groups and figures. The average modeller earns about Rs. 60 per month.

The more ordinary and cheaper toys are cast into moulds but others are made by hand. The toys are burnt either before or after painting, the latter being a more difficult process.

MANUFACTURE OF BRICKS AND TILES.

The manufacture of bricks is now a fairly common industry in Bengal and has extended to far-off mofussil. It is a paying business and the demand is always as great or even greater than the supply. The method of manufacture and burning are, however, crude in many places. The Bull's kiln is rarely in use in the mofussil.

Roofing tiles are now largely manufactured in factories and also by many Kumbhakars as a cottage industry. The productions are however often inferior in quality as no regard is generally paid to the quality of the soil and the preparation of the clay. There is an increasing demand for the roofing tiles and there is every possibility of this industry growing up into a large trade if the existing defects are removed.

CHAPTER VI.

CANE AND BAMBOO WORK.

Ordinary baskets of cane and bamboo for agricultural and domestic purposes are manufactured almost all over Bengal, generally by lower class people such as Doms, Muchis, Bauris, Bagdis, Rishis, Garos of the Mymensingh district and also Mahomedans of some places. This is a supplementary occupation and the cultivators too sometime take to it during their spare time. The work does not require much skill and it flourishes wherever there is an abundant local supply of cane and bamboo. The margin of profit is small and one cannot expect to earn more than Rs. 10 per month in this occupation even if he devotes his whole time to it. The varieties of articles are 'dhamas' of various sizes, 'kulas,' 'doles' (for stocking paddy etc.), sieves and different kinds of fishing traps etc. They are marketed for sale in all the important 'hats' of the mofussil.

Bamboo mats or 'chattais' are manufactured in large quantities in the district of Tipperah, Chittagong and the Hill tracts by the hillmen and also other people. Bamboos are obtained from the neighbouring hills and then finely split. The mats are woven to measure and ordinarily in two varieties of 36 × 54 ins. and

54 × 90 ins. They are exported to all the important business centres of Eastern Bengal such as Narayanganj, Dacca, Chandpur and Lohajang and also to Calcutta, Burma and other distant places. The hillmen manufacture also large quantities of packing baskets from split bamboos. The industry is however entirely in the hands of the Mahajans who furnish the capital and get the work done on contract system. The income of the actual workers is small.

High class cane and bamboo work is rare in Bengal, the district of Sylhet which is famous for such works being outside the administrative jurisdiction of the province. In several villages of the Tipperah district, namely, Konda, Binuti, Ranidia, Malai, Jinadpur, Meruna and Uttardhantalia fine articles of cane and bamboo such as tiffin baskets, suit cases, bags, chairs, sofas, tea tables, tepoys etc., are manufactured in fairly large quantities. The articles are imported to Calcutta and other important towns of Bengal where they find a ready market as the quality and finish of these articles are almost as good as those of the imported Japanese articles. More ordinary chairs, morahs, boxes and baskets etc. are manufactured in several other places of Bengal including Munshiganj and Manikganj subdivisions of the Dacca district, Rajbari and Madaripur in Faridpur, Rampurhat in Birbhum and Panagar on the E. I. Ry. Bamboo umbrella handles and cane sticks are made at Sitakund and several villages near Patiya in the district of Chittagong.

There is an abundant local supply of cane and bamboo in many of the districts of Bengal, particularly in the eastern and the northern parts of the province. There is no reason why this industry should not flourish here if the workers are trained and the business properly organised. Bengal canes are generally inferior in quality to Malacca and other important varieties but they are fairly suitable for the purpose and also cheaper in price. The necessary preliminaries are the training of workers, the introduction of up-to-date designs and the organisation of market. The first two things may be well accomplished through actual demonstration by experts in important centres of work. Indeed attempts in this direction in several places by the Dept. of Industries are reported to have borne fruit. The polytechnic Institute of Bagbazar (Calcutta) has experts and the necessary equipment for fine work and it may probably render help in this undertaking. The business orgasisation may, in the first instance, be taken up by benevolent workers or institutions. The Home Industries Association of Bengal may perhaps be of use in this connection.

MANUFACTURE OF MATS.

Mats (mandurs) for spreading purposes are an indispensable domestic necessity in many parts of Bengal. They are manufactured in large quantities in the district of Midnapur, Burdwan, Bankura and also 24-Perganas. Raghunathpur and several other neighbouring

villages of the Midnapur district and Dainhat in Burdwan are famous for high-class work and ornamental (naksa) weaving of mats. These mats are made of a kind of grass called 'Pati' of which several varieties, coarse and fine, are grown in many parts of the districts mentioned above. They are woven with strings which serve the purpose of warps. Very fine and naksa mats sell for high prices but they are generally made to order. The ordinary mats sell for annas six to Re. 1 per piece of the common size 4×6 ft. Mat weaving is a fairly paying occupation and there is always a ready market for the articles. Total business in these mats comes up to several lacs of rupees every year in Bengal.

Seetal Pati.

Mats of an excellent quality called Seetal patis are made from a kind of reed (motra or poitra) which grows in wild abundance in damp and marshy places. The finest patis are manufactured in the district of Sylhet and they sell for Rs. 6 to Rs. 8 or more per piece of the usual size 5×7 ft. Coarser patis are made in large quantities in the districts of Chittagong, Noakhali, Tipperah, Dacca and Faridpur. The prices range between Re. 1 and Rs. 5 per piece of the usual size. There is a good local market for these patis though large quantities are also exported to Calcutta, Rangoon and other places. They are ordinarily woven by a class of people called Patials or Patikars. The industry is a fairly paying one.

HOGLA MATS.

These mats are made of another kind of reed, called 'Hogla,' which grows abundantly in the char lands of lower Bengal. They are used for spreading by poorer people and also employed for various other domestic purposes.

Weaving of these mats is generally done by women folk of the cultivators, particularly the Namasudras of Eastern Bengal, in their spare time. The mats are sold in the 'hats' of Eastern Bengal and there is always considerable demand for them.

CHAPTER VII.

SPINNING, TWISTING AND REELING OF FIBRES.

Cotton spinning is an ancient industry in the Chittagong Hill Tracts. Cotton is a staple crop in this district, a portion of which only is consumed by the local spinners, the remainder being exported to other countries through Chittagong and Calcutta. About 20,000 Charkas ply regularly in the thanas of Patiya, Fatikcherry, Mirsarai, Satkania and Chakaria of this district. The yarn is inferior in quality to the mill spun as the cotton is generally short-stapled. But the major portion of the outturn is not marketed, it being woven in the domestic looms for clothing the family. Lower counts varying from 6's to 40's are generally spun in these places.

The Gandhi movement has given a great impetus to the spinning industry and spinning wheels in thousands have found their way into the houses of all classes of our people—though it is difficult to say that all or the majority of these machines now serve the purpose for which they are meant. The industry has however been organised in several places of the Dacca, Faridpur, Tipperah, Hooghly and a few other districts through the agency of the Khadi Pratisthan, the Abhoy Ashram and similar other orgnisations. Fairly large quantities

of yarn of lower counts are now spun in these places which furnish the raw material for the manufacture of Khadi. Some new types of Charkas have also been improvised during the last several years, but it seems that the primitive machine yet holds the field owing to its simplicity, effectiveness and comparative cheapness.

A fairly skilled spinner turns out one seer of yarn (6's to 40's) in about 8 days of 10 hours each. The profit thereof after deducting the price of cotton is about Rs. 2 only. So spinning by itself is scarcely a paying occupation as the margin of profit is inadequate, but its economic possibilities are great if adopted as a domestic occupation for the purpose of meeting the family requirements of clothes. Its success must therefore depend on conditions such as a desire for utilising one's spare time in spinning, wearing only homespun and also a very cheap supply of suitable cotton. The industry has survived in the Chittagong Hill Tracts amongst the hill people where these conditions exist.

Spinning of Jute.

The weaving of jute, as I have mentioned in a previous chapter, is carried on widely in several districts of the North and the Eastern Bengal, namely, Noakhali, Backergunj, Faridpur, Dacca, Mymensingh and Rangpur by the 'Kapalis' and also some Mahomedan cultivators. These people generally spin their own jute with the help of a spindle called 'Takku.' One can

spin about a seer of jute per day in this method. Charkas for jute spinning has now been manufactured and demonstrated at several centres of work by the Serampore Weaving Institute. They have been found to be useful and capable of increasing the outturn substantially.

SPINNING OF WOOL.

The manufacture of woollen fabrics *i.e.*, coarse blankets, is limited only to a few places in Bengal, as I have mentioned before. The spinning of wool is generally done by the women folk of the 'Bhediwallas' the operation of weaving being left to the male people. The spinning is done in a crude, heavy Charka.

MANUFACTURE OF ROPES, CORDAGES ETC.

Ropes, cordages and strings of jute, hemp and coir are manufactured in a number of small factories at Salkea, Ghoosery, Shalimar, Ultadingi and Chatra in Serampore. All the operations are done by hand in these factories. Jute and hemp are hackled, spun with the help of the country 'takku' and made into balls. The preparation of the coir is rather difficult, the cocoaunt fibres being extracted from the pericarp by the laborious process of hammering, either in the dry condition or after the latter has been steeped into water for a long time. The fibres are then spun, generally with the

country takku as in the case of jute and hemp. In the next operation the requisite number of strands are twisted together, an economy of labour being sometimes effected by passing them through pieces of bamboo, placed horizontally, which can be rotated by one person by pulling at the ends of a string. A long shed of 200 to 300 yards is necessary for a factory. The sunn hemp is obtained from Jubbulpore.

The manufacture of ropes and cordages is a paying business. During the last Great War when these articles were in great demand the factory owners earned large profits. The productions of many of these factories were found to be fairly satisfactory by the Marine Department.

Jute ropes of good quality are also manufactured at Agrabad in Chittagong. A twine known as 'tauta' is made in many places of Faridpur and Nadia. Towing ropes from sunn hemp are manufactured extensively in the Kishoregunj sub-division of the Mymensingh district and also at Sadar and Sirajgunj sub-divisions of Pabna. Hemp twines for the manufacture of fishing nets are made in large quantities in the Sadar and the Cox's Bazar subdivisions of Chittagong. The industry is however under the entire control of the Mahajans who supply the raw material and also purchase the finished products for marketing them in distant places. The manufacture of coir rope is also a jail industry in Bengal.

REELING OF SILK AND TUSSER.

Silk reeling is an important cottage industry in the district of Maldah while it is carried on also at Murshidabad and Birbhum (Rampur Hat) though in a much smaller extent. In the English Bazar and the Kaliachak thanas of Maldah there are about 5000 men engaged in this industry.

The reeling is done with the help of the country 'ghai' which is a revolving drum worked by hand. The cocoons are steamed before operation by suspending in a pot in which water is boiled. They are then transferred to a pan and boiled with water by direct firing. The operator takes the thread from a number of cocoons which depend on the danier required, and throws it over the ghai. The drum is rotated, ordinarily by a boy, when the yarn comes out winding round it. A ghai can work up about 3 seers of raw silk per month.

The industry is carried on under precarious and unsatisfactory conditions. The supply of raw material which depends on local productions varies from year to year owing to several reasons. Then again the supply is available during only certain seasons of the year when necessary stock must be purchased, blocking a fairly large capital. The industry is therefore entirely controlled by Mahajans—Marwari people—who furnish the necessary capital and then take the goods for disposal in distant markets, the local consumption being comparatively small. The actual workers receive

only a small fraction of the profits and they depend largely on the mercy of the middlemen. Several thousand maunds of silk are produced every year in Maldah the bulk of which finds market at Vishnupur (Bankura), Madras, Mysore, Hyderabad, the Upper and the Central provinces, the Punjab, Ceylon and Burma. The formation of co-operative organisations for the supply of capital and the marketing of finished goods may save the workers from the clutches of the Mahajans, but any enterprise in this direction must be backed by large capital and business capability for successfully combating the latter who are old in this trade.

Tusser reeling is done in Bankura (Vishnupur), Birbhum, Midnapur and other places where tusser weaving is in vogue. The process of reeling is almost similar to that described above. The tusser cocoons are however boiled in a solution of saji and cow's urine in water. The supply of raw material comes from the jungles of Chota Nagpur and the Central Provinces.

CHAPTER VIII.

CARPENTRY.

Carpentry is an ancient industry in Bengal. The industry as connected with the building of houses, temples, bridges and boats etc., existed in the days of yore as it does to-day. It has however gained in scope with the spread of modern civilisation.

A large number of people all over the province are engaged in carpentry and joinery in connection with building. The introduction of corrugate houses, which have been adopted very extensively in the East and the Northern Bengal, has created large scope of work for many of these workers. Besides the Sutradhars or the bonafide carpenters, a large number of Namasudras of Faridpur, Dacca, and Backergunj districts as also a number of Mahomedans have now taken to corrugate house building. These people generally commence as apprentice with an expert and then work as assistant for 5 or 6 years at the end of which most of them start business independently. The occupation is a fairly attractive one and there is enough work for all the artisans. A fairly skilled worker earns Rs. 25 to Rs. 30 per month in this occupation. House building in Calcutta and its neighbourhood has now largely passed away into the hands of the Chinese, the Punjabi

and the up-country carpenters. They are gradually ousting the native carpenters from this field of work by virtue of their skill and hard labour.

The manufacture of cabinet and furniture provides occupation to a large number of carpenters in Calcutta and mofussil towns such as Chandernagore, Dacca, Chittagong and many smaller places. In Calcutta alone six to seven thousand people are engaged in this work at Manicktolla, Bowbazar and Wellesley Street. Some of these carpenters are highly skilled in their work. The earning of a carpenter here varies from Rs. 30 to Rs. 100 per month according to individual skill and capability. The manufacture and repair of carriages also engage a large number of people at Bowbazar, Lohapatty and Wellesley Street.

Boat and ship building is another important branch of the industry. The manufacture of ordinary country boats is carried on everywhere in the districts of Eastern Bengal where boats form the only means of conveyance during the major part of the year. The demand for fishing boats is also considerable in these districts. The carpenters are either Sutradhars or Namasudras by caste. Cutters or 'Sampans' are manufactured in a number of villages of the Chittagong district, which lie on both sides of the rivers Halda and Sankha. Sloops and brigs of smaller sizes varying from 100 to 600 tons are manufactured in Chittagong. This is an ancient industry of this district and the local mistries who hail from Goshaildanga of P.S. Double

Moorings and several other villages on the banks of the rivers Karnafuli and Chaghtai are reputed for their skill in this art. Their method of procedure is first to mark out the design on the ground and then to work up the model, a miniature toy vessel, with proportionate measurements etc. The actual work is then done in several stages such as wood work, chaulking, sheeting, setting up of cabins and painting etc., one after another. Large number of men are employed for the purpose and the work pushed on vigorously. The vessels are manufactured generally for rich business firms such as Messrs. Sonaton Nityananda Roy, A. R. Dobhash, Messrs Krishnadas Umarchand Roy and several others who employ them for their own use or sell them at a profit. The "Star of Chittagong" a vessel of 646 tons was manufactured a few years back for Mr. A. R. Dobhash and she cost about Rs. 60,000. The daily wages of a ship-builder varies from Re. 1 to Rs. 5 according to individual skill. It is a hereditary occupation with these workers who never have had any academic training. There can be no doubt that with some training into the up-to-date methods of work and the preparation of sketches and designs etc. they can be turned into a valuable asset to this country.

Wood carving is another ancient art though it is now confined only to the doorworks of Indian houses, costly bedsteads and other furniture. There is little demand for such work now-a-days and the carpenters have lost much of their ancient skill in this art.

Wood work of miscellaneous nature is carried on in different parts of Bengal. The 'Hukka' tubes of Kamarpukur (Arambagh) and Comilla are well-known for excellent finish. The wooden sandals of the latter place are also much appreciated in Eastern Bengal. Penholders of decent quality are manufactured at Dacca and Comilla. Messrs F. N. Gupta and Sons of Calcutta are large scale manufacturers of this commodity. The Vishnupur Industrial Works of Babu Ram Sundar Chakravarty is an eminently successful enterprise in specialised wood work. Ram Sundar Babu started work with the manufacture of sticks, penholders, brush handles, and other articles of rather trifling value but his factory now turns out all varieties of tool handles, shovel handles, bobbins and looms of excellent quality. He is now a regular supplier of Messrs. Tata and Co., and some other Bombay firms. The wood is obtained from the neighbouring jungles of Bankura and Midnapur where there is an almost unlimited supply. The work is done by local hands trained by Ramsundar Babu. The factory employs nearly 100 men at present.

Pais or agricultural measures for paddy and other grains, popularly known as Suri bowls, are manufactured in Birbhum and also in a village near the Bankura town. They are made in varying sizes to the measures in vogue in this side. The bowls are dug out from wood and then ornamented with brass and copper bands in the outside. If specially required these bowls

are very well finished and finely ornamented.

The manufacture of packing boxes is carried on extensively in Calcutta. Several thousand carpenters are engaged in this work. Picture framing is also an attractive occupation and is now carried on extensively in Calcutta and smaller mofussil towns.

CHAPTER IX.

MANUFACTURE OF CONCH-SHELL ARTICLES.

The manufacture of conch-shell (or chank) bangles is an ancient industry as they are inseparably connected with married Hindu women in Bengal, during the life-time of the husband, since days immemorial. The industry is carried on in the town of Dacca, at Bankura, Vishnupur, Patrasaeyr (Bankura) and a few other places. But it has flourished most in the town of Dacca where the workers enjoy great reputation for their skill and fine workmanship. More than 2,000 Shankhya Banikyas or Shankharies are engaged in the industry at this place.

The articles usually manufactured are bangles, churries, bracelets and rings. The bangles are plain but fine ornamental work is done on churries, rings and other articles. The work is done in small factories—in several stages by different hands. Each of these workers is more or less an expert in his own province. For the manufacture of bangles and churries the inner core of the chank is first broken out and the outer cut into several annular pieces with a heavy semicircular saw which works by friction. This is a laborious process and requires great patience and also skill. The outer surface of these rings is polished by rubbing against a

flat sandstone while the inner surface is so done with a round-file coated with sand-dust. The ornamental work is done by expert workers with the help of a fine chisel and hammer. Two to eight bangles are cut out from a shell while the remainder is utilised for the making of rings, buttons and other trifles. The rejected portion of the shells is sold away for the manufacture of lime. The shells are obtained from Ceylon, Madras, Cochin and Baroda State through several Calcutta firms. The largest supply, which may be estimated at about 15 lacs of shells per annum, comes from the first two places. The prices of these shells vary from Rs. 150 to about Rs. 250 per thousand, according to quality. The bangles are sold for annas 8 to Rs. 5 per pair. They are also ornamented with gold and set with valuable stones, if so required. The factory owners are well-to-do men. The income of a fairly skilled worker is Rs. 30 to Rs. 35 per month.

A Co-operative Society has been formed amongst the Sankhya Banikyas of Dacca. The Society has under taken to solve the question of supply of raw material to the workers, which is now largely controlled by the middlemen. It is trying to establish direct business connection with the source. Attempts should next be made to improvise and to introduce better tools and appliances. The present method of cutting the shells is extremely laborious and slow. A suitable type of saw would effect considerable economy. The articles produced in the district of Bankura are crude and they

have only a local market. The workers here also suffer for want of regular supply of shells at reasonable price.

MOTHER OF PEARL.

The manufacture of mother-of-pearl buttons is a new industry in this province, though it has made considerable headway during the last several years. These buttons are made in large quantities at Dacca, Narayangunj and about half-a-dozen neighbouring villages with Nangalbund as their centre and at several villages of the Brahmanbaria Sub-division of Tipperah and also at Durgapur in Noakhali. Several thousand people are engaged in the industry at these places.

The shells are purchased from the local markets at Rs. 2 to Rs. 3 per maund. The supply generally comes from the district of Sylhet. They are first cut into pieces of required size and trimmed with a pair of sharp pliers. The edge is rounded off by friction against a revolving sandstone which is mounted on a wooden trough containing water, and worked by one hand. Necessary holes are bored with a hand drill. A slight polish is sometimes imparted to the buttons by rubbing with a mixture of charcoal and dilute mineral acid. They are then marketed for sale or supplied to the middlemen who deal in them. The Nangalbund 'hat' is one of the important marts for these articles. In addition to buttons a small quantity of fancy ornaments such as earrings, nose-pedants and watch chains etc. are manufactured at some of the places.

Men, women and children equally take part in the work. The buttons are however inferior in quality to the imported ones and sell for much cheaper prices. They generally lack in uniformity of size and thickness and some of the buttons are tinged with foreign, but natural colour. Practically no polish is given. The use of any artificial coating which may impart the necessary polish and also gloss may prove useful. Dyeing of the tinged buttons in suitable bright colours may also be attempted. If successful this will prevent the huge wastage of shells that now takes place owing to rejection on this ground.

ARTICLES OF HORN.

Combs of horn are manufactured at Churrihata in the town of Dacca, at Barisal, Bhola, Patuakhali, Galachipa and Amtoli of the Backergunj district. The horns are obtained from Calcutta and sometimes from the neighbourhood. The solid portion of the horn is first cut off and the hollow portion split into two longitudinally, with a saw. They are then heated over fire and when soft and malleable pressed into flat bars. The bars are cut into thin plates of required size. The teeth of the combs are next cut with a sharp saw. They are polished by rubbing with a mixture of charcoal dust and oil. These combs sell for annas four or five each and there is a good market for them in mofussil. The workers are all Mahomedans.

Horn buttons are manufactured from flat bars made in the process described above and also from solid portions of horns. The solid portions are first chiselled into cylindrical shape and then cut into pieces of required thickness. Horn bangles, snuff boxes and toys are also made at some of the places.

IVORY ARTICLES.

The manufacture of high class ivory articles is rare now though it flourished in the old days under patronage from fashionable rich people. There are at present 7 or 8 small shops at Berhampur and a few more at Calcutta which manufacture ivory combs, bangles, vermillion pots, safety-pins, images of Hindu gods and goddesses and also toys of varying description. The ivory is obtained from the merchants of Banstola Lane, Calcutta, who import them largely from Uganda. The articles are sold in Calcutta while a portion of them is exported to Delhi and other places. The workers are mostly 'Bhaskars' by sect.

STONE ENGRAVING.

Stone engraving is carried on in a number of shops at Calcutta. They generally engrave tablets to order for business houses, public institutions etc. Stone images for worship are manufactured at Dainhat in Burdwan.

CHAPTER X.

EMBROIDERY.

The art of ornamenting cloth and other fabrics with needle work is an ancient industry in this country and it flourished most during the Mahomedan ascendency. The wearing apparel of the nobility of those days used to be ornamented highly and even in the middle class Mahomedan families it was the ambition of the household ladies to have the clothing of the family embroidered as far as possible. But the industry is in a decaying condition now and it is already dead in some of the branches.

Indian embroidery is divided into several distinct forms such as (1) Zardosi *i.e.*, gold and silver work on velvet and satin (2) Kamdani or gold and silver work on silk and muslin, (3) Kasida or silk thread work on muslin or silk, (4) Phulkari or Phulbati *i.e.*, coloured silk work on cotton and (5) Chikan *i.e.*, white thread work on white washing fabric. Of these several varieties of embroidery Zardosi and Kamdani which thrived at Murshidabad and Dacca during the old days are extinct now. Only 3 or 4 Mahomedans in the town of Murshidabad carry on the work now during their spare time, as the demand is small.

The embroidery of Kasida is yet carried on to

some extent at Dacca and the neighbouring villages of Demra, Siddhiganj, Nawapara and Mutail. The designs are first printed on the ground work which is either muslin, bafta or silk. They are then worked out in mulberry silk or muga thread with the help of a needle. The work is done by women, mostly poor widows, and Mahommedan cultivators, Tantubayas, Goalas and other artisan classes of the town during their spare time. The occupation is of a subsidiary importance as the earning is limited only to Rs. 4 or Rs. 5 per month. The workers are paid on the piece system when the finished articles are gathered from them through intermediaries, locally known as 'Ostagars'. These intermediaries are in direct touch with the Mahajans in one side—to whom they are responsible for the work—and the actual workers on the other, who are scattered over a large area. They receive the supply of cloth, design and necessary thread from the Mahajan and then distribute the work amongst the workers under their control according to individual skill and capacity. The usual articles are handkerchiefs, tea cloths, table cloths, door and window curtains and long turbans which are largely in demand in Turkey and Arabia. There is no local market for those articles and they are exported entirely to foreign countries by the Mahajans through Calcutta and Bombay firms. There are about half a dozen Mahajans in Dacca who have the entire business in their hands. The business has however dwindled consider-

ably of late owing to the prohibition of foreign luxury articles in France and the replacement of turbans by furcaps in Turkey. The industry may possibly be revived if other markets are found out and newer designs introduced according to demand. Some Kasida cloths were exhibited in the Calcutta Exhibition of 1923 from which samples were gathered for the ensuing Empire exhibition. The embroidery of these articles is generally appreciated by European ladies and gentlemen.

The Chikan work is carried on extensively in Dadpur, Polba, Dhaniakhali, Haripal, Chanditola and Singur thanas of the Hooghly district, in Baraset, Deganga, Habra and Naihati thanas of the 24-Parganas and also in few villages of the Midnapur district. Several thousand people, mostly Mahomedan men and women, are engaged in this art which affords them a good subsidiary occupation while some of the workers depend mainly on it for their subsistence. The main varieties of work are drawn thread, perforation or cut thread, filled up and raised work. They are done on white linen, silk or cotton such as muslin, nainsook and longcloth with white thread in any of the above forms or in combination. The usual varieties of articles decorated are handkerchiefs, tea and table cloths, children and ladies' underwear, blouse and dress pieces, cushion and sideboard covers, window curtains, sheets and pillow cases etc. The designs are first printed on the cloths which together with the thread are distributed among the workers by the same class of intermediaries

as obtain in Dacca—but locally known as 'thandar' or 'sarkar.' The work is done either in small factories attached to the thandars' house or in the house of the actual workers. The workers are paid on piece system but the earning of an individual varies largely according to skill, quickness and the time he can devote. The work is done mainly for several Indian firms of Calcutta, notably Messrs Dutt Bros. of Park Street, while some of the thandars and also artisans work independently and hawk their articles in Calcutta and other towns and sometimes go even as far as U. S. A., and other foreign countries.

The demand for hand-made embroidery has persisted inspite of cheap machine made articles of depressing preciseness and similarity. But the indian trade is gradually losing ground owing to want of efficient organisation and adaptability to the requirements of the foreign market. A highly illuminating description of the Indian Chikan industry in its various aspects may be found in the supplement to the Indian Trade Journal of February 11, 1921, by Mr. L. B. Burrows B.A.,

Lace-making has been introduced here by the European missionaries. This is however confined only amongst the ladies of the higher and middle classes who sometimes utilise their spare time in this art. The productions are not marketed for sale.

Sujni i.e., bed sheets and table cloths etc. decorated in dyed cotton thread are made in Murshidabad. The decorations are generally done in floral and other

natural designs on white nainsook or mulmul. The articles are however rarely marketed for sale. An attempt has recently been made to introduce the industry at Faridpur under the auspices of the local Home Industries' Association.

CHAPTER XI.

TAILORING.

Tailoring is an old industry though it has thrived largely with the spread of modern civilisation. Tailors' shops are to be found now-a-days not only in cities but also in small villages. These shops make garments to order but a large number of them in Calcutta are engaged in making cloths of standard measurements for the bigger dress-makers of the city. These shops employ varying number of hands, but in the more ordinary ones there is the master tailor, who is often a cutter also, and 2 or 3 assistants who are paid monthly at the rate of Rs. 20 to Rs. 35 per month. The Tailors are mostly Mahomedans. The Singer's sewing machine is generally used in these shops. Tailoring is now taught in many of the girls' schools and convents in up-to-date lines. This may be extended with profit in most of our Girls' schools of old type.

HOSIERY.

Hand knitting machines of foreign make for the manufacture of hosiery, such as socks, stockings and underwear etc., have been introduced in Bengal in large number since the days of the Swadeshi movement. They

have found their way to interior mofussil as well as in Calcutta and other big towns. Some of these hosiery works are now run on factory lines and employ power. The industry has made considerable headway inspite of keen competition with Japanese articles which it had to face since its inception.

CHAPTER XII.

GOLD AND SILVER SMITHERY.

Gold and silversmiths are to be seen in almost every important village of Bengal as well as in towns and big cities. The craze for ornaments has only increased among our womenfolk with the spread of modern civilistion.

In Calcutta there are a number of well-equipped workshops in which ornaments are manufactured in fashionable and up-to-date designs. Besides, there are numerous small shops in the different parts of the city which carry on the industry in smaller scale. The city of Dacca and many villages of that district abound in gold-smiths who are ordinarily Subarnabaniks or Karmakars, while recruits from other classes such as Golas, Basaks, Kumbhakars, Dhobis and Barbers etc. are also considerable. The Dacca smiths enjoy great reputation for their skill and excellence of workmanship. These workers have migrated to different parts of the country and opened shops.

The more ordinary varieties of ornaments manufactured are balas, bracelets, neckchains, earrings, nose-pendants, rings and watch chains etc. Gold and silver utensils, rose water and attar pots, caskets, prize cups etc. are manufactured in Dacca and also at Bhowanipur

and Kansaripara in Calcutta. Gold is obtained from Burrabazar and precious stones, when necessary, from Jewellery merchants.

Filigree work of an excellent nature is carried on at Dacca. Presentation cups and other articles in filigree are made to design on order.

CHAPTER XIII.

CHEMICAL INDUSTRIES.

Shellac.

The manufacture of shellac as a cottage industry is yet carried on at Illambazar in Birbhum and in a number of small factories at Sonamukhi and Khatra in the district of Bankura. The processes of manufacture in vogue at these places are crude and unscientific and the industry is in a moribund condition.

The raw material is generally obtained from the neighbouring jungles of Chotanagpur where lac is cultivated. The crude product is first separated from the twigs, and the dead insects and superficial impurities are removed as far as possible. The material is then crushed into small particles either by a mortar and pestle or, as in factories, by a hand grinding machine. The particles are then sifted through a coarse sieve and those which do not pass through are crushed again until they are fine enough. The powdered mass is then steeped in a large volume of water for about 24 hours or more i.e., until the lac-dye is completely dissolved away. The material is thoroughly rubbed with hands or feet while in water. The red lac-dye solution is then drained off and the wet lump washed several times with fresh water. It is then dried and subjected to the

process of firing. The material is put into a piece of cloth and held over a small fire made by burning wood. The shellac melts and is squeezed out gradually. It comes out through the pores of the cloth, while the impurities remain inside. The shellac is made into small cakes and is generally very inferior in quality. In some of the factories this product is subjected to a further process of refinement and the shellac obtained in the form of very thin sheets known as the fine shellac of commerce.

The quality of shellac manufactured at the above places is not generally good. The bulk of the production is T. N. and only a small fraction fine qualities. The processes of manufacture, as I have said before, are crude and wasteful. The Department of Industries, Bengal, has made certain investigations in this connection and demonstrated the results at some of the factories. They are now embodied in a departmental bulletin which is distributed free. The shellac market has a tendency to fluctuate very often and this renders the problem of this industry more difficult to handle.

The red lac-dye solution obtained as a bye-product is utilised for the manufacture of 'Alta paint.' The solution is concentrated before it is bottled and sent to the market. At some of the places small pads of cotton are soaked in the concentrated solution and then dried. These pads are moistened with water before use.

At Illambazar excellent toys are made out of the impurities that remain inside the cloth after the ex-

traction of the shellac. This material has a shining surface and when painted in bright dazzling colours it looks very beautiful. There are about a dozen families of 'Nuris' at Illambazar who manufacture lac toys such as fruits, animals and also paper weights, etc. These toys find a ready market in the fairs and exhibitions that take place in the district during the winter.

PAPER.

Paper is yet manufactured, though in very small quantities, by cottage workers known as 'Kagjis' at Mahanad, Shahbazar, Dasghora and several other villages in Hooghly, at Kristopur in Murshidabad, Arial in Dacca and Kagjipara (P. S. Patiya) in the district of Chittagong. A considerable number of Kagjis were engaged in this industry a few decades before but only a very few carry it on now as a secondary occupation during the winter when there is little work in the fields. The industry is fast dying and there is little hope of its survival against the competition of the mills.

The raw material is generally furnished by jute or sunn hemp while only waste paper, including the cuttings from the book-binding shops, is employed for the purpose in the district of Hooghly. The material is first made into small pieces and then steeped in water containing small quantity of lime. The mass is taken out after about 2 days and the water removed as far as possible by pressing. It is then pounded thoroughly

under a 'dhenki.' This operation is generally done by womenfolk and is very tedious. The soft pasty mass is now kneaded against a rough surface—a flat earthen dish, specially made for the purpose. The kneaded mass is again steeped in a dilute solution of lime in water to which small quantity of 'saji' is sometimes added. After about 2 days the mass is thoroughly washed in a stream or tank by holding it in a canvas bag, until the alkali is entirely removed. The pulp is now thoroughly mixed with a large volume of water contained in a vat or reservoir. A fine bamboo sieve fitted in a wooden frame is dipped into the reservoir and slowly taken out. The fine layer of pulp which deposits on the sieve is carefully detached and spread on a mat for drying. This operation goes on until most of the pulp is worked. When dry the sheets are sized with a thin layer of starch solution made from boiled rice. A small quantity of Arsenic Sulphide is sometimes added to this solution to give yellow colour to the paper. The sheets are then trimmed. For imparting a polish they are stretched on a wooden board and a heavy, smooth stone is rolled on them.

The demand for this home made paper is limited. It is used only by book-binders, astrologers and also some shop-keepers and Zamindari offices for the making of account books. It is generally stronger than the mill-made paper and is rarely attacked by insects. The margin of profit earned by the manufacturers is however very small and the industry is likely to die out altogether

in the course of a few years more. The stuff is however suitable for the making of cover pages of books, periodicals and pamphlets etc. and if extensively employed for the purpose the industry may yet have a fresh lease of life against the mill competition.

SOAP.

Crude washing soap or 'Bangla Saban' is manufactured in fairly large quantities in the Eastern Suburbs of Calcutta, at Dacca and many other smaller towns. All varieties of cheap oils including that of Mohua, ground-nut, concoanut etc. and also animal fats obtained from the butchers' shops are employed as the raw material. Crude caustic soda of commerce is used as alkali, while kaolin, washing soda, chalk and sodium silicate are often used as fillers. The oil or fat (or a mixture of both) is heated in big iron pans and a roughly measured quantity of alkali in water is gradually added to the boiling liquid. The mixture is then heated for 7 or 8 hours and the excess of the alkali or fat neutralised by addition of fresh materials. The soap is then allowed to cool. This is heated once again afterwards when the filling materials are added. The soap is then shaped in earthen moulds or roughly by hands, in spherical lumps. It is then ready for the market.

The process of manufacture, as would appear from the above description, is crude and hardly scientific,

though the manufacturers have acquired some skill by long practice. But there is a good demand for these soaps which are largely used by the poorer and the middle class people. There is apparently great scope for the improvement of this industry which, if achieved, would render it more paying and attractive. The huge amount of fat obtainable from dead carcasses which is now wasted all over the country may be profitably utilised for the manufacture of these soaps.

Attempts have been made at Dacca and other places for the manufacture of toilet soaps on cottage scale, but this does not appear to have met with any considerable success.

PERFUMERY.

Perfumed hair oils and scents are manufactured at Calcutta and a few other places. But the products, except those of a few up-to-date and well -organised factories, are either bad imitations or mixtures of foreign imported stuff. They are however cheaper in price and have generally a good market.

MATCHES.

A number of small match factories were started in the districts of Tipperah, Dacca, Faridpur and Backergunj either with Dr. Nandy's machine or any other of a guillotine type within the years 1921 and 1924. Most of these factories utilise the indigenous Simul, Kadamba, Debdaru and Chhatian etc. for the manu-

facture of sticks and box veneers. The machires are used for splitting, chipping and cutting. The splints are however not properly bleached and impregnated in many of these factories while the chemical composition of the matches is very often not adequately damp proof. Pasting, labelling and the other processes of finishing are done by hand with the help of crude accessories and implements. This is generally done by outside labourers, mostly poor women and children, on piece system. The daily average outturn of a small factory is about 6 gross of matches and the profit thereof, after deducting the cost of production, is about Rs. 3. But many of these factories cannot work throughout the year round and also for long at a stretch.

The match industry is a highly technical one and depends for its success largely on expert knowledge and local conditions. Most of the small factories I have mentioned above had not taken these facts into consideration and as a consequence some of them were only shortlived while others are yet struggling for existence. But there is, it seems, prospect for the development of the match industry on cottage line if it is properly organised. The industry may be divided for working purposes into different branches, such as splint making, box making and finishing etc. and individual concerns may confine their activities only to a selected branch. The best results may be achieved when such concerns work in close co-operation for their common benefit and the general welfare of the industry. This will lessen

the strain on the capital which is necessarily small in such concerns and create facilities for the purchase of materials on wholesale rates and also afford good scope for specialisation. A self-contained small match factory has little chance of success against the competition of well organised big manufactories.

GLASS.

A number of Mahomedans are engaged in glass blowing near about College Street and Machuabazar in Calcutta. They melt broken pieces of glass in ordinary furnaces fed by wood and manufacture inkopts, kerosine lamps etc. of inferior quality with the help of a blow pipe and a few moulds.

BEES' WAX CANDLES.

Bees' wax candles are manufactured at Chinsurah on small factory scale by a local gentleman. Crude wax is first refined by boiling with chemicals when impurities separate out and are removed. A number of threads are then tied on a circular bamboo frame which is suspended horizontally from the ceiling. This is rotated slowly and the liquid wax poured on the threads from above. The process continues until the candles gain the required thickness. Sometimes dye stuffs are added to the liquid wax to give the candles fancy colours. They are sometimes made in enormous sizes and also ornamented on the surface.

These candles are however costlier than the paraffin candles of the market. They are used for burning in temples, churches and on various religious occassions.

DYEING.

Dyeing of fabrics, particularly the wearing apparel, is an ancient industry. It used to be carried on in old days by a class of people called 'Rangshaj' who used the various vegetable dyeing matters for the purpose. The industry is now in the hands of 'dhobis' and up-country Mahomedans who carry on their business in Calcutta and other big towns. They use the various synthetic dyes of commerce, but the dyeing is generally of an inferior kind and very often defective.

A large number of modern dyeing and cleaning shops have now been opened in Calcutta and its suburbs. But the dyeing has not improved much.

Block printing of saris, chaddars and handkerchiefs etc. is done in Calcutta in fairly large scale. The workers are generally up-country Mahomedans. There is now-a-days considerable business in these articles.

DRUGS AND MEDICINES.

Kaviraji medicines are manufactured by the practitioners for their own patients and also for sale in the market. Several factories have also been opened for the manufacture of these medicines on large scale. The

manufacture of patent medicines and drugs have extended considerably of late.

FIRE-WORKS.

Ordinary fire-works are made in towns as well as in villages by people called ' Bajikars '. They are patronised liberally during Hindu religious festivals, marriage ceremonies and also on other merry occasions.

CHAPTER XIV.

AGRICULTURAL AND MISCELLANEOUS INDUSTRIES.

Sugar and Molasses.

Molasses or 'Gur' is manufactured from cane and date juice in many of the districts of Bengal. The canes are crushed now-a-days mostly in the three roller machines of Messrs. Renwick and Co. which are supplied on hire, but the old, indigenous wooden rollers are also in use at some of the places. The juice is boiled in big iron pans over ordinary furnaces fed by crushings, straw and also wood. The date juice is boiled in small earthen pots specially made for the purpose. There is a huge wastage of heat in these furnaces owing to the want of devices for proper utilisation, while the quality of the 'Gur' is also badly affected by direct and open firing. The product generally contains large amount of impurities as little or no attempt is made for removing them. There is however a constant demand for this commodity in the market. Better varieties of 'Patali' from date juice are manufactured in the districts of Faridpur and Dacca and they sell for much higher prices. Gur from palmyra juice is made, though in limited quantities, in the districts of 24-Parganas and Midnapur.

The manufacture of sugar from cane is now rarely carried on as the cost of the product is prohibitively high and cannot stand the competition of foreign imported stuff. Small quantities are only manufactured here and there to meet the demand of such customers as would not use the mill-refined sugar for religious purposes. Gur, for this purpose, is again boiled for several hours in big earthen pans with water and a small quantity of alkali or 'Saji.' The scum is removed as it forms on the surface. After this operation the mass is left to solidify. After 2 or 3 days it is transferred to another vessel which is specially made with perforations at the bottom. A layer of water weed known as 'Pataseola' is placed below the lump and another above it. The liquid portion of the molasses trickles down gradually, while the formation of non-crystalline sugar begins at the surface in thin layer. The sugar is removed and the layers of weeds are changed from time to time. The operation takes several days to complete. The yield of sugar is about 30 per cent. of the 'gur' or the raw material.

The manufacture of sugar from date 'gur' is carried on extensively in the district of Jessore in villages such as Kotchandpur, Keshabpur, Jhikargacha, Tahirpur, Basundia and many others on the banks of the Kapotakshy, the Chitra and the Bhairab. The process of manufacture of 'dolo' or non-crystalline sugar is almost similar to that described above except that the gur as obtained from the market is subjected to the

treatment of 'Pataseola' without any further boiling and that the process is carried on in bamboo baskets. The yield of sugar is somewhat more than that obtained from cane gur. For the manufacture of 'Akra' or crystalline sugar the gur is pressed in gunny bags until the liquid portion separates out as completely as posisible. The mass is then dissolved in water and boiled in large pans until the solution is sufficiently concentrated. It is then allowed to cool in flat vessels when crystalline sugar separates out. 'Dobara' or refined sugar is prepared either from 'dolo' or crystalline sugar after removing the impurities by boiling with lime water and small quantity of milk.

The industry is gradually declining owing to unfavourable competition with foreign imported stuff. There is however yet considerable business in Jessore sugar for which the local demand is ample. The introduction of scientific methods which may be within the reach of cottage workers will yet save this industry from ruin.

TOBACCO.

Tobacco for hooka smoking is ordinarily prepared at home but in towns and big 'bandars' it is manufactured in large scale for sale. The Vishnupur tobacco manufactured by Messrs. Atul and Hem Chandra Kars and the preparation of Fauzdari Balakhana in Calcutta are highly appreciated for their flavour and taste. 'Bidi' tobacco is manufactured extensively in all towns and

important places of business. Tobacco for this purpose is imported from Gujrat, while the inferior local produce is also used at many places. The leaves of 'kend' obtained from the C. P. and Chota-Nagpur through Calcutta merchants are used for rolling. The workers are generally poor children and destitute and elderly men and women, but able bodied men also sometimes take to it for making a living. The industry is a fairly paying one and large factories have now been established at many places for 'bidi' manufacture on large scale.

Cigars are manufactured at Cox's Bazar by Mug men and women for domestic consumption. Attempts have been made by the Burirhat Government experimental farm for the introduction of cigar making as a subsidiary occupation amongst the cultivators of several villages of the Rungpur district.

RICE HUSKING.

Rice husking with 'dhenki' or the indigenous treadmill is carried on everywhere by the womenfolk of the cultivators and other poor people. Large number of rice mills have now been established all over the country but this ancient cottage industry still gives occupation to innumerable poor and destitute women. Mill rice is mostly exported, but 'dhenki' rice is generally used for local consumption.

Oil Pressing.

Many 'kulus' or oilmen yet carry on oil pressing in the country 'ghani' but their number is gradually decreasing. The product of the oil mills is cheaper in price, but the ghani oil is mostly genuine and consequently of a better quality. Mustard, til, linseed and other oil seeds also are pressed in these ghanis. Cocoanut oil is manufactured in several places of the Noakhali and the Backergunj districts by extraction with hot water.

Book Binding.

This is carried on in most towns and important places by Mahomedans called 'Duftries' who hail from Mymensingh, Dacca or the Noakhali districts. In Calcutta machineries for cutting, perforating and rounding etc. are employed in some of the book binding shops, but in other places all the operations are generally done by hand. The occupation is a fairly attractive one.

Paper Pouch, Envelopes..

Large quantities of paper pouch or 'thonga' are required by the shop-keepers, particularly grocers, for packing articles. They are made of waste paper obtained from 'feriwallas' who gather them from house to house. Many destitute women and children find a

suitable occupation in the manufacture of these 'thongas' for which there is always considerable demand.

Envelopes for writing are also made in large quantities by children and women. Machines are now generally used for the cutting of paper, but the making up is done by hand.

THE END.